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The Morehouse *Journal of Science*

BURWELL T. HARVEY, JR., *Editor*

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FEATURES

OUR VIEWPOINT

FLETCHER H. HENDERSON.

On April 25th, 1930, under the auspices of the Georgia Association of Colleges and Secondary Schools will be celebrated in the Randolph County Training School at Cuthbert, Georgia, the close of fifty years of faithful service in teaching and training the Negro youth of Georgia of Fletcher H. Henderson.

At that time a faithful soldier will have a short day of glory, hear words of approval and appreciation, receive some presents and many hearty handshakes. But methinks for Henderson the day will bring many recollections of boys and girls who have passed out across the thresholds of many different schools of meagre equipment during all those years. Some to greatness, perhaps, but none without receiving some gift from human contact, with a noble soul.

All glory, honor and praise to Fletcher H. Henderson. You have not worked in vain. Immortality is yours in the lives of your former students.

WANTED—BY NEW YORK PUBLIC LIBRARY.

The following numbers of the Journal mentioned are needed in the New York Public Library's file and the courtesy will be greatly appreciated if readers who no longer need their issues will donate them to the Library, namely: Vol. I, Nos. 1, 2, and 3. We shall be grateful for your assistance in this connection. Also we should be glad to reimburse owners for at least five copies each of the following issues. Vol. III, Nos. 1, 2, and 4.

THE ACCREDITMENT OF HIGH SCHOOLS IN GEORGIA.

According to the latest published list of accredited High Schools of Georgia, the following Negro schools made Grade I or II as shown:

Albany:
- Georgia Normal & Ag., I.

Americus Institute, II

Athens:
- High & Industrial School, I.
- Union Baptist Institute (Priv.), I.

Atlanta:
- Knowles High School. (Priv.), I.
- Booker T. Washington High School, I.
- Morehouse College H. S. (Priv.), I.
- Clark University H. S. (Priv.), I.
- Morris Brown University, (Priv.), I.
- Spelman College H. S., (Priv.), I.

Augusta:
- Haines Normal Ind. Inst., (Priv.), I.
- Paine College H. S., (Priv.), I.
- Walker Baptist Institute, (Priv.), II.

Bainbridge:
Hutto High School, I.
Brunswick:
Selden Institute, (Priv.), I.
Cordele:
Gillespie Normal, II.
Cuthbert High School,II.
Forsyth:
A. & M. State School, I.
Ft. Valley High & Ind. School, (Priv.), I.
La Grange:
East Depot St. High School, II.
Macon:
Ballard Normal, (Priv.), I.
Sandersville High & Industrial School, II.
Savannah:
G. S. Ind. College High School, II.
Thomasville:
Allen Normal, (Priv.), I.
Douglasville High School, II.
Waycross:
Center High School, II.

It is interesting to note the following points about this list:

1. Of the twenty-six accredited, twelve are privately supported. connected with Colleges or Normal Schools. Two others, Americus and Walker Baptist, also private institutions, have no work above the twelfth grade. These two schools are the only private institutions not accredited as grade I. During 1930-1931 three of the private schools in Atlanta, namely, Knowles H. S.; Morehouse H. S., and Spelman H. S. will be consolidated into one small demonstration High School in connection with the Educational Department of Atlanta University.
2. There are only seven accredited high schools supported by municipal governments, and five of these are in Grade II, denoting less equipment in laboratory, library, or that they do not have three-fourths of the teachers college graduates, but offer 16 units.
3. Only four-year schools are accredited.
4. There are in the state 367 accredited high schools for white boys and girls.

We feel that a Negro Supervisor of High Schools as a member of the State educational machinery would help to relieve this condition. A programme of education of school boards, city superintendents, Negro principals, teachers and parents concerning the need and value of accreditment, would pave the way for real interest in the best available teaching and teaching facilities for Negro boys and girls in the Empire State.

American Chemical Society.

The annual meeting of the American Chemical Society was held in Atlanta, April 7-11th. Of the great number of chemistry teachers

in Negro Colleges in this vicinity, only two out-of-town teachers were noted at the meetings. Prof. C. M. Standish from Talladega, and Dr. L. F. Bates of West Virginia State College. Prof. Dickinson of Spelman College attended the meetings. Dr. Bates and the writer were the only Negro members present. In addition the members of the advanced organic chemistry class of Morehouse College registered and attended the meetings as undergraduate visitors. It is expected that their reports will form the basis of an interesting seminar.

How many of our schools would have seen the wisdom of sending the head of their Chemistry Department, with expenses paid, to such a meeting as did West Virginia in the case of Dr. Bates? Administrators, you cannot cover all the meetings. Give the heads of your departments the value of such contact and information. It seems a good investment to the school. How about it? Teachers of chemistry lost an opportunity of getting in on the ground floor with reference to chemistry and its relation to the future development of the south. "How can I, unless someone teach me."

Reorganization and Expansion.

By the next issue we hope to be able to acquaint our readers with the details of a reorganization which we hope will permit of expansion, and make our Journal of greater efficiency and service to our subscribers.

Junior-Senior College Program.

Changes in general organization of collegiate work are illustrated by the increase in growth of junior colleges. During the past year an increase of more than 25 per cent in the number of junior colleges reported is noted in the Educational Directory published by the Bureau of Education. Fundamental changes have been proposed in the organization of our existing system. The proposal to reorganize on a six-four-four basis has received a wide and interested hearing. This plan provides for 6 years of elementary education, 4 four years of a new-type secondary education, and 4 years of secondary-collegiate education. University training for qualified students would then begin at what is now the junior college year in college. The plan contemplates closer correlation of the high school and the college, growth in the number of junior colleges, and changes in the objectives of the 4-year liberal arts colleges.

—Annual Report of the Commission on Education,
June 30,1929.

The junior college as ordinarily organized is an independent 2-year unit to which pupils are admitted upon graduation from high school. A plan by which the two years of junior college would be combined with the last two years of high school has been advocated by authorities such as Koos, Proctor, and Eby. In April, 1928, the school board of Pasadena, Calif., definitely adopted the 6-4-4 plan. Johnstown, Pa., and Hillsboro, Tex., are other school systems in which

the junior high school is a 4-year unit with another 4-year unit of senior-high-school-junior-college grade more or less clearly defined. Principals Ewing and Harbeson and Superintendent Sexton of Pasadena have discussed the advantages of the 6-4-4 plan in recent articles.

Opinion appears to be crystallizing in favor of two general types of curriculums, one preparatory to further college work, the other terminal with the end of the junior college. The terminal courses, too, are frequently of two kinds, those designed for students who desire some specific type of vocational training, and those intended for students whose plans for entrance upon a vocation are not so definitely matured.

—Secondary Education, Carl A. Jessen.

It is quite within the bounds of possibility that during the next generation both Columbia University and other universities that have the inestimable advantages of an urban situation may find themselves surrounded by a whole group of junior colleges that have sprung up as the result of their several influences and inspirations. The administration and oversight of a group of such junior colleges would present no serious difficulties and their teaching positions would naturally be filled, chiefly at least, by men and women trained at the university under whose auspices they have been brought into being. Junior colleges, wherever they are, will do well to seek university affiliation.

—President Nicholas Murray Butler.

This Commission holds that in the United States public education. elementary, secondary, and higher, should aim specifically to develop in each individual the habits, the powers, the knowledge, and ideals whereby he will live worthily as an individual, as a member of a vocational group, and a member of the civic groups—municipality, state, nation, humanity.

In accordance with this conception, we recognize four main objectives of education; namely, personal culture, and domestic, vocational, and civic efficiency.

—Reorganization Commission of SecondaryEducation.

Suggested program for Junior College as a basis for a Senior College of three years leading to a master's degree giving opportunity for concentration in two subjects after second year of college.

Subjects, five periods per week unless otherwise shown on chart. Each period forty-five minutes. Fifteen minutes intermission between periods.

School six days per week.

Class Units not to exceed twenty-five.

One lecture each week in each subject summarizing material covered the preceding. This lecture to be given either the first period of the following week or the last period of a closing week.

This program is based on the quarter system.

The following chart shows how the classes might be arranged in order to have four classes each day before noon for which preparation would be necessary. The afternoon classes would be used as shown. This will allow one free period during the morning which could be arranged so that it would come at the end of the second period. The vacant period might be used by the students for rest, study or recreation.

The following courses would call for organization and scope in view of the aims of the Junior College to prepare the student in such fundamental tools as Language and English, a cultural development as music and ethics and introductory courses with a view for giving to the student a survey of the particular field of knowledge as well as an opportunity of finding out the aptitudes and abilities of students in any given field, as Biology and Chemistry.

	Mon.	*Tues.*	*Wed.*	*Thurs.*	*Fri.*	*Sat.*
8 A. M.	A	A	A	A	A	
9 A. M.		B	B	B	B	B
10 A. M.	C	C	C		C	C
11 A. M.	D	D		D	D	D
12 Noon	E	E	E	E		E
	Dinner					
2 P. M.	F	G	H	G	H	

FIRST YEAR COLLEGE

First Quarter	*Second Quarter*	*Third Quarter*
Freshman Mathematics	Mathematics	Mathematics
English	English	English
Chemistry Inorganic	Chemistry organic	Geology
History G. & R.	History to 1819	History to present & Contemporary
Language	Language	Language
Freshman Ethics	Freshman Ethics 1	Freshman Ethics 1
Music History and Appreciation 2		
Phys. Education 2		

SECOND YEAR COLLEGE

First Quarter	*Second Quarter*	*Third Quarter*
Language	Language	Language
English	English	English
Gen. Biology	Sociology	Economics
Psychology	Physics	Physics
Government 1	Logic	History of Education
Orientation 2	Orientation 2	Orientation 2
Phys. Education 2		

THIRD, FOURTH, AND FIFTH YEAR COLLEGE

Major subject

Minor subject

Two subjects selected where attendance and note-book is required.

No Examinations.

Subjects selected to be approved by officers in charge of Major and Minor.

IMPORTANT PLAN ANNOUNCED BY ATLANTA UNIVERSITY

Will Conduct Modern Department School
In Connection with Department of
Education

A demonstration school, beginning with kindergarten and going through four years of high school, is among the important plans for the next academic year of Atlanta University, according to an announcement by President John Hope. The school will be conducted in connection with the University's Department of Education and will be for the purpose of giving to students in that department practical observation and training in teaching methods.

The kindergarten and elementary grades will be taught in the Oglethorpe School on the University campus and the high school grades in Giles Hall on Spelman campus. The latter building will be remodeled to accommodate the school, laboratory, library, and other facilities being provided. If desired, high school students attending the school may enroll in the boarding department of Spelman College. In announcing the plans for the new school, President Hope says:

"Education for Negroes can be improved only through better teachers. The University will be meeting one of the greatest needs among Negroes if it can provide the proper training of teachers—teachers with thorough knowledge, teachers who can think with accuracy and precision, teachers with character and personality, and with such a contagious enthusiasm for their work as will inspire and stimulate young people coming under their direction.

"The Demonstration School, through its faculty, will provide an example of good teaching, but its main emphasis will be the welfare of the pupil. The aim will be to train the pupil in thoroughness, accuracy and in knowledge of the subject. The purpose of the Demonstration School is not primarily to give students in the Department of Education practice in teaching, but to provide them with an opportunity to observe good teaching and its results."

LIBRARY SUMMER SCHOOL IS PLANNED FOR COMING SUMMER

Rosenwald Fund Sponsors Six Weeks' Course
and Will Assist Librarians To Attend.

An Institute Course for Negro Librarians is to be held here June 14-July 25 in connection with the Morehouse-Spelman Summer School, according to an announcement from the offices of the Rosenwald Fund which is making the institute possible.

The course will be under the direction of Miss Charlotte Templeton, president of the Southeastern Library Association, and lectures

on various phases of library work will be given by expert librarians from Atlanta, Knoxville, Louisville, Hampton Institute, and other places. The major subjects, it is announced, will be Library Service for Children and the Use of Books, the instructors being Miss Mary Carpenter of Spartanburg, S. C., and Miss Ruth Theobald of Louisville. Instruction in book repair will be given by a member of the staff of the Greenville Public Library.

Only librarians employed or under appointment to positions are eligible for admittance. The Rosenwald Fund will assist students to attend by paying railway fare to Atlanta and return. Tuition and living expenses must be provided by the students themselves, but will not be high. Those qualified to attend the institute and desiring to do so are asked to communicate with Miss Charlotte Templeton, President, Southeast Library Association, Greenville, S. C.

AIN'T IT FINE TODAY!

Sure this world is full of trouble—
  I ain't said it ain't
Lord! I've had enough and double
  Reason for complaint.
Rain and storm have come to fret me
  Skies were often gray:
Thorns and brambles have beset me
  On the road—but say,
Ain't it fine today!

It's today that I am living
  Not a month ago,
Havin', losin', takin', givin',
  As time will it so.
Yesterday a cloud of sorrow
  Fell across the way:
It may rain again tomorrow,
  It may rain—but say,
Ain't it fine today!

THE THERMOELECTRIC FORMULA X MINUS Y EQUALS Z

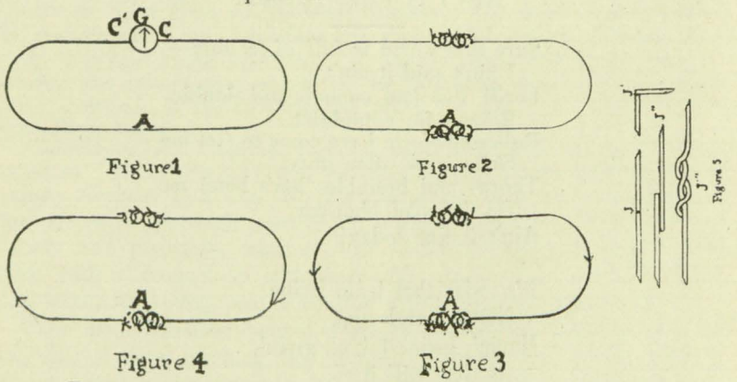
LUCIEN V. ALEXIS
McDonogh 35 High and Normal School,
New Orleans, Louisiana.

PREFATORY NOTE

The thermoelectric circuit is a lever the weight and the power of which are at the ends comprising the juncture. The fulcrum is a point within the circuit but away from the juncture. Heating the jncture destroys the equilibrium in which the fundamental force of matter at every point in the circuit ordinary finds itself.

THERMOELECTRICITY

The thermoelectric current is a lever of the first class, the elements of which are in a closed curve, and the general formula for which is X minus Y equals Z.



TYPES OF JUNCTURES AND THE THERMOELECTRIC CIRCUIT

EXHIBIT 1

Let Figure 1, Exhibit 1, represent a closed circuit. Let G represent a galvanometer, portable standard jewel bearing type; AC′, a 744mm. piece of No. 28 German silver wire, .38mm. in diameter; and AC, a piece of copper wire of the same dimensions. Let AC′ be known as the left arm of the circuit; AC, the right arm; C′, the terminal of the left arm; C, the terminal of the right arm; and A, the juncture of the two arms. Let the juncture be not soldered or fused, and let equal portions of the juncture be equally heated.

The needle of the galvanometer will move toward the terminal of the copper arm.

Now, there are three general types of junctures possible. AC and AC′ may be joined end to end (J, Figure 5). surface (J′ ′, Figure 5), or surface of one end of the other (J′, Figure 5). Then, too, AC and AC′ may be of the same material or of different materials. Furthermore, in length AC may be equal to AC′, greater than AC′, or less than AC′. Finally, at A, AC may be given as much heat as, or more heat than, or less heat than is given to AC′.

Using pieces of copper, of iron, of brass, and of German silver wire, and applying the flame of a fish-tail burner perpendicularly and transversally to the wires at A, vary the experiment as indicated above.

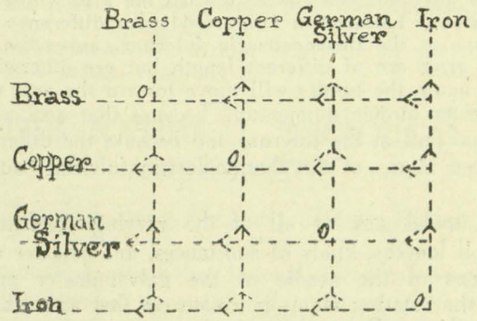
The variations disclose several facts.

1. Arms different in substance and in relative amounts of junctional heat, but equal in length and in diameter give stronger currents than do arms of the same substance though of like differences in relative amounts of junctional heat, of like equal lengths, and of like equal diameters.

2. Of the given kinds of wire, German silver and iron produce the strongest current in similarly conditioned thermoelectric circuits. According to the strength of current, the order of the couplets is

a. German silver and iron
b. German silver and copper
c. German silver and brass
d. Brass and iron
e. Copper and iron
f. Copper and brass

3. The direction of the motion of the needle of the galvanometer in such circuits is indicated by the solid arrow-heads in Figure 6.



Directions of the Needle in Thermoelectric Circuits Having Arms Equal in Length, in Diameter, and in Portions Heated or Chilled at the Juncture
Exhibit 1, Figure 6.

4. When the fires are placed edge to edge, surface to surface, or surface to edge, the current is the same for any given couplet under similar given conditions, and is greater than when the ends of the given couplet are entwined at the juncture.

5. When wires entwined at the juncture are removed from the flame without destroying the juncture, they continue producing current longer than when the same wires otherwise similarly conditioned have a different type of juncture.

6. In arms made of different substances, other conditions being equal, the longer the circuit or the greater the diameters the less the current.

7. In any array of equally conditioned couplets having one arm constant as to kind of material and the other arm variable in that respect, the needle moves toward the arm of greater specific heat; and the order of strength of current is inversely proportional to the ration of the specific heats of the arms.

Now, consider these facts in the light of Fundamentals in Physics and in Chemistry.

According to that physics, atoms of different substances vary in size, and at the same temperature such atoms are rotating at different rates. Hence, two like amounts of heat distributed among the atoms of two arms similarly conditioned will give like increases of momentum to atoms at the point where the heat is applied. The atomic momenta transmitted will give like opposite strains to the atoms on either side of the thermoelectric fulcrum, the point where the transmitted atomic momenta meet (Figure 3). The pull in either arm is toward the point of origin of the increased atomic momentum —that is, toward the atoms on its side of the juncture. Accordingly, there will be no difference of strain at the fulcrum.

When, however, the arms of the circuit are equal in length, different in kind of substance, but otherwise similarly conditioned, the needle of the galvanometer moves toward the arm whose atoms have the greater atomic momentum (Figure 4); for difference in momenta between atoms at the thermoelectric fulcrum causes the current.

When the arms are of different length but are otherwise similarly conditioned, again the needle will move toward the arm whose atoms have the greater atomic momentum, because that arm will have the greater atomic pull at the fulcrum and because the difference in momenta between atoms at the thermoelectric fulcrum causes the current.

Similarly, under any or all of the varying conditions—relative diameters and lengths, kinds of substances, and relative quantities of heat—positions of the needle of the galvanometer arise because strain from the rotating atoms is greater in that arm whose terminal is nearer to the needle.

At ordinary temperature the atoms in either arm at juncture A are rotating, but the difference between opposing atoms within any given pattern at the juncture is small, and hence, the value of the difference is not enough to overcome the intermolecular adhesion within the pattern. When the atoms are heated or chilled, a difference in pull sufficient to overcome such intermolecular adhesion is established, and is then transmitted toward the fulcrum.

In all of the given cases, as indicated by the broken arrow-head (Figure 6), the direction of the current from chilling is opposite to that from heating, and the amount of current is considerably less. Therefore, the results from chilling constitute a delicate check against the results from heating.

Hence, under conditions of equal amounts of heat, the same kind of substance, equal diameters, and equal lengths as pertain to the arms of the thermoelectric circuit, the amount of current and the position of the needle of the galvanometer are expressed by the formula.

X Minus Y Equals Z, or 0

where X represents the strain exerted at the fulcrum by the atoms in one of the arms, Y represents the strain exerted there by the atoms in the other arm, Z represents the value of the current, and the sign of Z represents the direction of the current. The formula suggests that the amount and the direction of the current vary as the wires vary in relative length, in actual length, in relative diameter, in actual diameter, and in the relative and actual amounts of heat on both sides of the juncture. The experiment above confirms the suggestion.

Increased heating at the juncture increases the value of both minuend and subtrahend factors in the thermoelectric formula. Hence, heating first one wire at its free end and then heating like amounts of both wires at the juncture, or retaining the juncture, or retaining the juncture in the flame in such a manner that the value of the subtrahend factor of the formula increases faster than does the value of the minuend factor, or removing and cooling the juncture so that the value of the minuend factor decreases faster than does the value of the subtrahend factor, or heating one or both arms while heating the juncture will in each case affect the amount of current and the direction of the needle in accordance with the algebraic sum in the formula, X minus Y equals Z.

In short, the thermoelectric circuit is a lever of the first class and its formula is X minus Y equals Z.

THE NATIONAL TECHNICAL ASSOCIATION

Charles S. Duke, *President, Chicago, Illinois.*

The first annual report of the National Technical Association, was printed and distributed in the year 1926. Nothing seems better, at this juncture, than to quote in full the FOREWORD of that report which is as follows:

> "At the present time, economic consideration seem to be uppermost in the minds of the ruling classes of the world. Economic advantage is won and maintained through the operation of efficient organization and mass action. The physical resources of the entire world are divided up and parcelled out geographically to the more favored groups of humanity.'
>
> 'If through force of circumstances, a group must maintain its racial identity, it will be only through effective mass organization directly by the most efficient apostles of applied science that that group will be able to maintain its place in the sun. The other alternative is commercial and economic servitude. In a society where he happens to constitute the minority group, the person of color will be able to impress himself favorably upon

that society only through the reaction of the brains and character of its men of the applied sciences.'

'In recognition of the foregoing statements, the National Technical Association is presenting its First Annual Report merely as a gesture in the hope that it will provoke consideration of these things on the part of the of the thinking members of the darker races."

There are now three local branches of this Association in existence, one in Chicago, one in the State of Ohio with offices at Wilberforce University, and one in Washington, D. C., with offices at Howard University. The National Technical Association originated in the City of Chicago, December 10, 1925, and was incorporated under the laws of the State of Illinois August 25, 1926. Just about the same time that the men in Chicago were gathering for the formation of this organization, men in the State of Ohio began meeting for the same purpose. Out of their effort came the American Negro Technical Society. When our Mr. W. E. B. DuBois, editor of the *Crisis*, inquired of Mr. George Arthur, then Secretary of the Wabash Avenue Y. M. C. A., and now member of the Rosenwald Fund, whether or not an article could be prepared on the Negro technical man, Mr. Arthur thought of calling in a few men of this type into the Y. M. C. A. to dinner. Instead of getting an article for the *Crisis* out of this meeting, Mr. DuBois and Mr. Arthur unwittingly laid the foundation for the National Technical Association.

The Y. M. C. A. dinner was attended by Mr. Sam R. Cheevers, C. E., graduate from Howard University, then a member of the Engineering Department of the Illinois State Highway Commission; Mr. F. C. Downs, graduate of Armour Institute and instructor in the Chicago Public Schools; Mr. Chas. H. Dukes, graduate of Harvard College and a practicing structural engineer; Mr. W. I. Gough, civil engineer from Howard University and a member of the Engineering Department of the Pullman Company; Mr. Jas. A. McGehee, civil engineer, graduate of Armour Institute, member Engineering Department of the Board of Local Improvement of the City of Chicago; Mr. Oscar Randal, civil engineer, graduate of the University of Illinois and a member of the engineering corp of the Chicago Sanitary District; Mr. Howard D. Shaw, graduate of the Electrical Department of the University of Michigan and chief electrician for the Pullman Company; Mr. A. D. Watson, graduate of the Electrical Department of Howard University and electrician for the Pullman Company and Mr. A. T. Weathers, graduate chemist from Armour Institute and Senior Sanitary Chemist, City of Chicago.

The first meeting of these men was characterized by an enthusiasm which bespoke great things for the future. A temporary organization was formed with Mr. Chas. S. Duke as president. With this group of men as a nucleus, a constitution was adopted, incorporation was secured and a pamphlet was issued. One of these pamphlets fell into the hands of Prof. M. A. Chavous of Wilberforce University and in the spring of 1928, he journeyed to Chicago and apprised the Chicago group that Ohio technicians were also organized and suggested co-operation. As a step to this end, Mr. Chas. S. Duke was invited to address the American Negro Technical Society of Ohio at Wilberforce University. He accepted the invitation and made his address at Wilberforce in April of 1928. Mr. S. R. Cheevers, one of the organizers of the Chicago Branch and a Charter member, made a trip to Howard University, his Alma Mater, where he encouraged the formation of a branch of technical men in the East and suggested co-operation between the three branches. Conditions were ripe for such a thing as this and indeed an organization of this character had already come into being or was being created. The Howard University group at first labored under some disadvantage because a goodly portion of its membership was composed of undergraduates whereas the thought was to interest technical graduates who were successfully following their chosen line of endeavor. However, this Branch has shown a wonderful and enthusiastic spirit of co-operation before which all obstacles must necessarily fall. To Prof. E. R. Welch, the business of successfully working out this problem has been entrusted.

The group at Wilberforce University has also worked under handicaps which it is most gloriously overcoming. Althought it is composed of successful and distinguished technicians, its membership is scattered. Despite this, it is a healthy vigorous organization.

The Chicago group is composed of a membership of men following a variety of technical pursuits. This is to be expected in the metropolis of the West which probably offers the largest field of endeavor to be found in America for the development of technicians whether white or black. Of the Chicago Branch of the National Technicial Association, it can be truthfully said that the genius of organization is born of an environment of conflicting interests and the dire need of the spirit of co-operation.

The first national meeting of colored technical men took place in Chicago, June 23, 1928, upon the call of the National Technical Association. It must be said, however, that had it not been for the wonderful spirit of co-operation as well as initiative on the part of the American Negro Technical Society and the Howard University Engineering Society, the meeting would have hardly been possible. The men met and were taken for—sight-seeing trips to the great water supply cribs of the City of Chicago, the Fisk Street Station of the Commonwealth Edison Company and the manufacturing plant of Mr. Paul E. Johnson, a member of the Association. A temporary organization was formed at a convention held at the City Club, of which Mr. Chas. S. Dukes was made president, and Mr. E. R. Welch of Howard University, secretary.

The next annual meeting was held in Chicago, August 17, and 18, 1929. After several trips and a banquet, the temporary organization convened at the Appomattox Club and there adopted a permanent constitution and elected the first permanent officers. Mr. Chas. S. Duke of Chicago was elected President, Prof. M. A. Chavous of Wilberforce University, Vice-President; Prof. E. R. Welch of Howard

University, Secretary and Treasurer, and Messrs. H. R. Lewis, L. K. Downing and Elmer Cheeks were elected to form the first Membership Committee. The next meeting of the Association will be held at Dayton, Ohio, August 15, 16, and 17, 1930.

The purpose of the National Technical Association will become apparent upon an analysis of modern civilization as we now find it. So predominant has applied science become in the life of man that this is now called the *machine age*. Our entire system seems to be built around three factors—a Trinity, if you please—composed of Labor, Capital and Technology.

It was pointed out in the FOREWORD quoted above, that, right or wrong, for the present at least, the American Negro is set aside as a distinct group of American citizens. Nearly every Presidential Message refers to this fact which is, apparently a foregone conclusion. This separateness one feels in nearly every phase of life of the Negro in America. It is, therefore, incumbent upon him, as far as possible, to develop a group which can function independently as far as possible. In the parlance of the Army, "A division is a military group which can function in the field independently." It is supposed to be equipped with all the adjuncts necessary thereto. In a way, the Negro group in America must similarly function.

The justification for the presence of the black man in this country—was his labor. With the coming of freedom and a measure of economic independence he has created some capital through the operation of inherent traits of thrift which manifest themselves in both the lower and the higher animals. With his labor and his capital, he remains practically helpless to raise himself to a position of dignity among his fellow citizens. This, the third element of the Trinity, Technology, is necessary in order that the Negro group might function normally. The National Technical Association proposes to supply this deficiency and is, therefore, addressing itself to Labor and Capital, trusting that it will be received in a spirit of co-operation, thereby producing useful results.

Article 2, Section 1 of the Constitution, states the objects of the Association. It is quoted as follows.

> "The objects of this Association shall be to collect and disseminate information concerning the opportunities of a Negro in the technical and engineering fields; the aid and encouragement of Negro Youth in preparation for these fields; the advancement of science and engineering in all its branches; the promotion of the interest of the profession among the darker races and the breaking down of barriers in the profession due to race prejudice."

The aims as set forth in the above quotation might be epitomized as follows:

1. The dissemination of information.
2. Encouragement of Negro Youth.
3. Advancement of science.
4. Promotion of professional interest of darker races.

5. The breaking down of prejudice in the Profession.

Of the five objects, the first two and the last seem most earnestly to command our attention. The ten million or more Negroes in the United States must have need for a great deal of services of workers in the applied sciences. The number of Negroes following these businesses is far below the quota that should evist in comparison with other modern, civilized people. Negroes who as individuals have need of the services of individual architects, engineers or chemists are a large enough clientele to furnish a lucrative practice for those of their own race who happen to be in the business. Negro institutions such as churches, fraternal and financial organizations swell the number of possible clients. Great educational and philanthropic foundations which assist in the construction of buildings for education and social work might also be added to this number. The National Technical Association hopes to bring to the attention of these persons and agencies the fact that there are some technical men in the country competent to supply them with efficient service along technical lines. The National Technical Association will further attempt to apprise its membership of the great opportunities for business from the sources just enumerated above.

By far the most important object of this Association, however, is to aid and encourage the Negro youth who has had the hardihood to stem the tide of this most precarious calling of a worker in the applied sciences. With very few minor exceptions, white engineers, architects or chemists invariably refuse to offer employment to persons of known Negro identity. Highly trained young Negroes are being graduated yearly from some of the best technical schools in America. These young men are finding it increasingly difficult to find offices in which to work so as to acquire the necessary practical experience to make them efficient. Many, in disgust, are chosing the more common professions awaiting Negroes or entering the Postal or Pullman service. Responsibility for this unspeakable barbaric condition rests with the Negro, himself, with certain laudable exceptions. It is commonly known that the Negro public prefers white technicians. The excuse is that the Negro is inefficient. This excuse is magnified by the Negro's white competitor. Architects and engineers, we are told, are the handmaids of wealth. Possibly some of the most inexcusable offenders of the Negro technical man are the Negro banks.

Standing themselves upon the shifting sands of voluntary racial patronage and race pride, some of them brazenly discard the Negro technician upon the basis of inefficiency without giving him anything approaching a fair trial. As the blind man who asks for alms, they have received an economic competence which they in return refuse to share with others. It may be said, on the other hand, that the Negro Church is possibly the best friend of the Negro technician along architectural lines.

If this condition is to be changed, a radical reversal of policy is absolutely necessary. Negroes are and have been making good as technicians in some of the largest and most successful white corporations in this country. Negro history in America, furnishes many

examples of exceptional Negro scientists. The Negro race can only develop its scientific men by giving them business to do. This is the only method whereby a nursery can be developed for training young Negro scientists. The American Negro should make his contribution to this scientific age but this will be done only when the race as a whole makes up its mind to do this very thing.

The fifth and last one of the objects referred to above is the effort to break down the prejudice to be found in this field. Instances of this occur chiefly in organizations maintained by public taxation. The Negro technician is no problem at all in private business for usually he is hastily eliminated if there is any objection to his presence. The case, however, is a little different with regard to public institutions The National Technical Association invites the opportunity of helping the technical man employed upon public work when there is an attempt being made to remove him purely because of race prejudice. There has been one instance in which the Association had to use its influence.

The progress being made to organize Negro technical men is very satisfactory considering all the difficulties involved. Most of the technical men in the three centers where local branches have been established have become affiliated with the organization. The attendance is good and enthusiastic meetings are held. A growing fraternal spirit is evident. The day when one is inclined to say that he is the first man in his line or the only man in his line is passing. The thought seems rather to be to increase the number of qualified men who may be successful in the technical world. From various centers at which it is possible to organize local of the Association, word comes of the enthusiastic willingness for co-operation. As most of the organization must proceed by correspondence the work has been necessarily slow. The National Technical Association has no traveling organizer as no funds have been set aside for such a purpose. Indications are evident that such an organizer could do most efficient work in the way of advancing the economic interests of the colored citizens of the United States.

In conclusion, the future plans of the National Technical Asso ciation will be to bring about more efficient and abiding co-opera tion between Negro capital and Negro technicians. This, of course, will be a most profitable arrangement so far as Negro labor is concerned. A wonderful opportunity exists for the consideration of this meeting at the Annual Fact Finding Conference to be held at Durham, North Carolina, April 16, 17 and 18 of this year. The thought seems to be quite current that the Negro is out of place in this machine age of practical science. He is commonly thought to be incapable of a thorough understanding of higher mathematics and the failure of a few Negro candidates to West Point and Annapolis is held up as a case in point. Authentic history as well as modern history is replete with refutations of this ludicrous charge.

It now remains for the Negro clearly to justify the glorious record made by the black technicians of ages by making it possible economically for him to exist.

THE PERISCOPE

JAN MATZELIGER

I have reserved for the last the name and work of Jan Matzeliger, of Massachusetts.. Although there are barely half a dozen patents standing in his name on the records of the office, and his name is little known to the general public, there are, I think, some points in his career that easily make him conspicuous above all the rest, and I have found the story really inspiring.

As a very young man Matzeliger worked in a shoe shop at Lynn, Mass., serving his apprenticeship at that trade. Seeking, in the true spirit of the inventor, to make two blades of grass grow where only one grew before, he devised the first complete machine ever invented for performing automatically all the operations involved in attaching soles to shoes. Other machines had previously been made for performing a part of these operations, but Matzeliger's machine was the only one then known to the mechanical world that could simultaneously hold the last in place to receive the leather, move it forward step by step so that other co-acting parts might draw the leather over the heel, properly punch and grip the upper and draw it down over the last, plait the leather properly at the heel and toe, feed the nails to the driving point, hold them in position while being driven, and then discharge the completed soled shoe from the machine, everything being done automatically, and requiring less than a minute to complete a single shoe.

This wonderful achievement marked the beginning of a distinct revolution in the art of making shoes by machinery. Matzeliger realized this, and attempted to capitalize it by organizing a stock company to market his invention; but his plans were frustrated through failing health and lack of business experience, and shortly thereafter, at the age of 36, he passed away.

He had done his work, however, under the keen eye of the shrewd Yankees, and these were quick to see the immense commercial importance of the step he had accomplished. One of these bought the patent and all the stock that he could find of the company organized by Matzeliger. This fortunate purchase laid the foundation for the organization of the United Shoe Machinery Company, the largest and richest corporation of its kind in the world. (See, in Munsey's Magazine of August, 1912, on page 722, biographical sketch of Mr. Sidney Winslow, millionaire head of the United Shoe Machinery Company.)

Some idea may be had of the magnitude of this giant industry, which is thus shown to have grown directly out of the inventions of a young colored man, by recalling the fact that the corporation represents the consolidation of forty-one different smaller companies, that its factories cover twenty-one acres of ground, that it gives em-

ployment daily to 4,200 person, that its working capital is quoted at $20,860,000, and that it controls more than 300 patents representing improvements in the machines it produces. From an article published in the Lynn (Mass.) *News*, of October 3, 1889, it appears that the United Shoe Machinery Company, above mentioned, established at Lynn a school, the only one of its kind in the world, where boys are taught exclusively to operate the Matzeliger type of machine; that a class of about 200 boys and young men are graduated from this school annually and sent out to various parts of the world to instruct others in the art of handling this machine.

Some years before his death Matzeliger became a member of a white church in Lynn, called the North Congregational Society, and bequeathed to this church some of the stock of the company he had organized. Years afterward this church became heavily involved in debt, and remembering the stock that had been left to it by this colored member, found, upon inquiry, that it had become very valuable through the importance of the patent under the management of the large company then controlling it. The church sold the stock and realized from the sale more than enough to pay off the entire debt of the church, amounting to $10,860. With the cancelled mortgage as one incentive, this church held a special service of thanks one Sunday morning, on which occasion a life-sized portrait of their benefactor looked down from the platform on the immense congregation, while a young white lady, a member of the church, read an interesting eulogy of the deceased and the pastor, Rev. A. J. Covell, preached an eloquent sermon on the text found in Romans 13:8—"Owe no man anything but to love one another." Let us cherish the hope that the spirit and the significance of that occasion sank deep in the hearts of those present.

There are those who have tried to deny to our race the share that is ours in the glory of Matzeliger's achievement. These declare that he had no Negro blood in his veins; but the proof against this assertion is irrefutable. Through correspondence with the mayor of Lynn, a certified copy of the death certificate issued on the occasion of Matzeliger's death has been obtained, and this document designates him a "mullato."

Others have tried the same thing with reference to Granville T. Woods, a too kind biographer, writing of him in the Cosmopolitan in April, 1895, stating that he had no Negro blood in him. But those who knew Mr. Woods personally will readily acquit him of the charge of any such ethnological errancy.

Another effort to detract from Matzeliger's fame comes up in the criticism that his machine was not perfect, requiring subsequent improvements to complete it and make it commercially valuable. Matzeliger was as truly a pioneer, blazing the way for a great industrial triumph, as was Whitney, or Howe, or Watt, or Fulton, or any other one of the scores of pioneers in the field of mechanical genius. The cotton gin first given to the world by Whitney, was not perfect but the essential principles of its construction are found clearly in Whitney's machine. The complex and intricate sewing machine of today, with its

various attachments to meet the needs of the modern seamstress is not the crude machine that came from the brain of Elias Howe; the giant attachments to meet the needs of the modern seamstress is not the crude machine that came from the brain of Elias Howe; the giant locomotives that now speedily cover the transcontinental distance between New York and San Francisco bear but slight resemblance to the engine that Stephenson first gave us. In fact, the first productions of all these pioneers, while they disclosed the principles and laid the foundations upon which to build, resemble the later developments only "as mists resemble rain"; but these pioneers make up the army of capable men whose toil and trial, whose brawn and brain, whose infinite patience and indomitable courage have placed this nation of our in the very front rank of the world's inventors; and, standing there among them, with his name indelible, is our dark-skinned brother, this patient, resourceful Matzeliger.

—*The Colored Inventor.*

WENDELL KING, RADIO ENGINEER

Radio Station WEDH in Erie, Pennsylvania, is a station on the Erie *Dispatch-Herald*. The programs of this station are broadcasted from Canada to the Gulf of Mexico and reach thirty-nine states of the Union. The chief engineer of the station is a Negro, Wendell King. He is a member of the institute of Radio Engineers. Mr. King is a graduate of Union College of Schenectady where he majored in electrical engineering, studying under the well-known Steinmetz. For a time he worked in the reseach laboratory of the General Electric Company and then became a sergeant in the army during the war. After the war he was employed by an electrical manufacturing company in Cleveland and then took charge of a radio station at Ashtabula. Under his personal supervision this station was moved to Erie in December, 1927. Mr. King is twenty-nine years of age, and unmarried. His station is atop of the Commerce Office Building, an eleven story skyscraper.

COLORED PHYSICIANS

The State Board of Health is endeavoring to arrange a post graduate course beginning June 17 in Atlanta for the colored physicians of the state. It is hoped that this course will include obstetrics, pediatrics, venereal diseases, and tuberculosis. It will be given free of charge if the proper co-operation is secured. Definite announcement will be made later.

—*Georgia's Health.*

NEGROES ASK RADIO

An appeal for a place on the air for the American Negro was made before the Federal Radio Commission by Dr. W. K. Thompkins, managing editor of the Kansas City *American*, Negro newspaper,

which is seeking a permit to build a radio station in that city.

It is said to be the first formal broadcasting application made by a Negro organization. Thompkins told the commission 15,000,000 Negroes in this country need a broadcasting station as a medium for promulgating their spiritual life, their ambitions and their music.

The Kansas City paper wants to build a 250-watt station which would operate unlimited time on the frequency of 1170 kilocycles. Four other stations now broadcast on that channel.

TOM'S TOASTED 'NUTS HONOR DR. CARVER

It is quite interesting to those who keep in touch with the work that Dr. George W. Carver is doing to know that two placques are now being made of him. Tom Houston of Columbus, Ga., is having this done. They are being modeled in clay by Miss Shultzer of Baltimore. Miss Schultzer is a noted sculptress, whose work is known throughout the United States. After they have been modeled in clay they will be sent to Italy, where they will be cast in bronze. They will cost $2,500.00 One will be placed at the Institute and the other will be placed in the Chemical Laboratory of the Tom Houston Plant. This is placed there as an inspiration to the chemists who work there.

WHAT A CHANCE!

Cheer up!
You have two chances
One of getting the germ
And one of not

And if you get the germ
You have two chances
One of getting the disease
And one of not

And if you get the disease
You have two chances
One of dying
And one of not
And if you die,—Well, you still have two chances.

—*Child Health News.*

DECIMAL CLASSIFICATION

LOUIS SHORES, *Librarian*
Fisk University, Nashville, Tennessee.

If there is one thing which distinguishes an American library from one in Europe it is efficiency. Walk into the Bibliotheque Nationale in Paris today and ask for a book, and as like as not you will be asked to come back tomorrow. If you should protest, the temperamental Frenchman is likely to gesticulate wildly or to shrug his shoulder non-chalantly until you have reconciled yourself to the inevitable. The reason is that the continental library is not practically classified.

Theoretically, Europe knows classification as well as America. Have not its philosophers speculated about the organization of man's knowledge for centuries? Did not Aristotle present us with a scheme for grouping the various subjects that comprise the total of all we know? To say nothing of Bacon and Comte and Spencer. But if we examine the systems of these men we are rewarded only with an incentive to controversy. Bacon's objective method assumed that history is the science of memory, and philosophy is the science of reason, and all other subjects come in either one or both of these classes. August Comte, on the other hand, was concencerned with flattering sociology rather than philosophy. Hence, he reasoned, all sciences pass through three stages of development: theological, metaphysical and positive. Mathematics, he considered the lowest of the positive sciences; sociology the highest. Likewise, Spencer also classed the sciences under the three heads: abstract, such as logic; abstract-concrete as physics and mechanics; concrete, such as astronomy and sociology. All three men were intersting but highly impractical.

Fundamentally, there is no difference between the classification of knowledge and the classification of books, since books are the records of all that man knows. (Indeed, the very latest philosophical treatise on classifying man's knowledge was written by a librarian.) ( ). The difference comes in the application of the system. Obviously, if one is to accept speculative theories as the basis of classifying a library it will take at least until next week to get the book you want today. On the other hand no system of classification can totally disregard the relationships of the various subjects that comprise man's knowledge. Hence a practical-logical combination is necessary for a workable classification.

In America, as in Europe, libraries operated on a hit-and-miss system for years. As late as the middle of the last century Frederick William Poole, the father of the periodical index idea, instituted a fixed classification system in the Boston Athenaeum. This meant that the book remained in a fixed place on the shelf and was located by floor, room, case, shelf and movable furniture. As long as the equip-

( ) Bliss, Henry Evelyn. Organization of Knowledge, Henry Holt, 1929.

ment remained fixed, books could be located occasionally. But as son as an inspired janitor undertook to move a flower pot, and the book on psychology became the sixth instead of the first book the other side of the rubber plant, only God Himself could come to the rescue of the confused librarian. The idea of fixed location was therefore abandoned and books were moved freely about, but the problem of classification remained unsolved.

Necessity proved again that she is the mother of invention. With the rise of public libraries it becomes important that the community collections should show use if taxes were to be appropriated for the support of the new venture. One of the greatest obstacles to use was the matter of locating a book exactly at the time the reader wanted it. Various extremes in experimentation went on. Books first were placed on the shelf in the order which they came into the library. Then some one conceived the idea of arranging books by their physical appearance: color, size, binding, etc. But the obvious difficulty arose: readers did not ask for a book in that way; they were interested in subjects and not in red bindery.

About 1870, a young farmer boy from up-state New York entered Amherst College. Like several other Freshman, he had no money for tuition, but he had ideas, especially about decimal numbers. His proposition to the President was, in exchange for tuition I offer to put the library in order. The President was delighted, the bargain was concluded and Melvil Dewey put his famous Decimal Classification into practice for the first time.

In 1876, the American Library Association met in Philadelphia. There were gathered many gray-haired librarians perturbed by this problem of classification. It was not new or insignificant, if one may judge from the role of minds that had been speculating for centuries. There came also a young upstart, Melvil Dewey, librarian of Amherst College with a head that swarmed with decimal numbers. They listened to his youthful enthusiasms with the wiseacre's tolerance. In the end, half of the libraries agreed to give the new system a trial for one year and to report back at the next annual convention.

The story of the system from then on is just a series of conquests. All of the librarians came back to acknowledge the Messiah. The other librarians tried decimal numbers. The system worked wonders. It was so simple and yet so ingenious. By the end of the century the Dewey Decimal Classification was finding its way into the remostest corners of the world. Today, over 90 per cent of all American libraries are classified by the Decimal system. Europe, Asia, Australia, South Africa and the islands of the Pacific know Dewey numbers. China has rounded up the collections of its ancestors with decimal numerals. The International Institute of Brussels has reorganized the system as a universal tongue independent of national boundary lines. Soviet Russia has issued an official decree compelling all libraries to reclassify according to the "D. C.", and the League of Nations library is adapting the system to its needs.

Dr. Dewey took man's knowledge and divided it into nine broad classes:

1. Philosophy
2. Religion
3. Social sciences
4. Philology
5. Natural sciences
6. Useful arts
8. Literature
9. History

Then realizing that some books like encyclopedias include all of these subjects, he created general class which he called Zero. This was followed by a secondary summary in 100 divisions 10 for each class. Thus, to illustrate, the literature class divides as follows:

800—Literature, (00 General)
810 Literature, American
820—Literature, English
830—Literature, German
840—Literature, French
850—Literature, Italian
860—Literature, Spanish
870—Literature, Latin
880—Literature, Greek
890—Literature, Minor

A third subdivision gave 1000 sections, 100 for each class and 10 for each division, thus

820—English literature (general)
821—English literature, *poetry*
822—English literature, *drama*
823—English literature, *fiction*
824—English literature, *essays*
825—English literature, *oratory*
826—English literature, *letters*
827—English literature, *satire, humor*
828—English literature, *miscellany*
829—English literature, *Anglo-Saxon*

The divisions go by tens. Each section has 10 subsections, thus

821 —English literature—poetry
821.1—English literature—Early English Poetry
821.2—English literature—Pre-Elizabethan Poetry

and thus

821.1 —Early English Poetry
821.11—Lavamon (who was an early English poet.)

Nice as the system of multiple tens is, it is by no means the nicest feature. There are, for example, many mnemonic advantages which make it easy to remember where books are placed. We have noted that zero is the number for the general class. General is always zero no matter what it describes. Thus 100, contains *general* philosophy, 200 *general* religion books, 300 *general* social sciences, etc. We have noted also that 9 stands for history class. History, then is always 9. Thus 109, general *history* of philosophy, 209 general *his-*

tory of religion, etc. When preceded by zero division these sections have the following significance:

1. philosophy	201 philosophy of religion
2. compends	202 compends of religion
3. dictionaries and encyclopedias	203 encyclopedias of religion
4. Essays	204 Essays on religion
5. Periodicals	205 periodicals dealing with religion
6. associations, institutions and societies	206 Religious societies
7. education	207 Religious education
8. collections	208 collections on religion
9. history	209 History of religion

Now while periodicals are always 5, five is not always periodicals. Five may be Italian, grammar, Asia or oratory depending on its position in a number. This much is true: periodicals are always 5, history is always 9, essays are always 4, education is always 7, etc.

To substantiate these statements, 330 is the number for economics (300 social sciences, 3 economics, 0 general, since economics is one of the social sciences.) For a history of economics one adds the history number and get 330.9. Education is a social science. To get books in this field we add the education number 7, and we have 370, general books on education; a general history of education is 370.9.

Countries also have special numbers as follows:

2 England
3 Germany
4 France
5 Italy
6 Spain

In class 400 we find books on philology or language. A general book on the English language would be 420, German language 430, French language 440 ,etc. Since dictionaries always have the number 3, an English dictionary would be 423. The relationship between language and literature is very marked:

420 English language	820 English literature
430 German language	830 German literature
440 French language	840 French literature

The sections in literature also have special significance

1 poetry	821 English poetry
2 drama	832 English drama
3 fiction	843 French fiction
4 essays	854 Italian essays
5 Oratory	865 Spanish oratory
6 letters	876 Latin letters
7 satire, humor	887 Greek satire
8 miscellany	828 English miscellany

Finally, to use the geographical numbers once more, let us examine the history class.

900-909 is general history divided according to the section rule when a number is preceded by zero. From 910 to 919 is devoted to travel; 920-29 to biography, usually most closely related to history, and 930-939 to ancient history. Then follows the continental division which occurs throughout the classification scheme:

940-949 Europe
950-959 Asia
960-969 Africa
970-979 North America
980-989 South America
990-999 Oceania, Polar regions.

Turning to Europe for a moment, 940 is a general history of Europe. England being part of Europe we add the number for England, and get 942 English history. Likewise 943 is German history, 944 French history, etc. Going back to travel which extends from 910 to 919, the continental division is employed from 914 to919. Thus 914 classes books on travel in Europe. For a book on travel in England we would have to look for 914.2, travel in German 914.3, travel in France 914.4, etc.

Enough examples have been given to illustrate the mnemonic features of the Dewey Decimal Classification. Books are arranged on the shelves in the order first, of their numbers, and second alphabetically by author. Since no symbols other than Arabic numeral are used the system is not dependant on language. Thus 330 would be economics equally in English, Chinese, Dutch or Russion and truth is lent to the assertion that libraries speak a universal language.

What are the weakness of this system? Undoubtedly there are some, but the universal use of the classification indicates that its shortcomings are those which characterize all human efforts. True, a number of rival classifications have sprung up for which greater scholarliness is claimed, but by and large the D. C. rules the libraries.

There is no better evaluation of Mr. Dewey's system than that made by the Institut International de Bibliographie when, after studying all available classifications, it adopted the "D. C.", as best adopted for its projected universal subject bibliography to cover ultimately all subjects in all languages in all periods of the world's history: "1. D. C. was of topics, independent of language or exact synonym by which expressed. 2. Its notation was in itself the only international language, since it consisted solely of Arabic numerals used by all the world. 3. Its decimal principle allowed indefinite intercalation."

The twelfth edition of the Decimal Classification is itself a unique contribution to American literature. Written in the simplified spelling of which Mr. Dewey has been the chief sponsor for over a half century it sums up the whole theory behind all system of classification more succinctly than any previous philosophical dissertation. It records the development of a simple idea from the first edition of 1876 with twelve pages of tables to the present edition of 551 pages. There is included in the book a relative index of inestimable value which enables the user to ascertain instantly the specific number.

American libraries lead the world today. Continental librarians are frankly coming to America for methods of increasing their usefulness of their collection. During the past year The Vatican Library has been reorganized under the direction of Dr. Bishop of the University of Michigan. Reference has already been made to Russia and other nations. The stimulus to this new library service can be traced to Dr. Melvil Dewey's Decimal classification.

I'M PANTING FOR AIR AND SUNSHINE

Tune—*Painting the Clouds With Sunshine*

I've been a hood from the start,
It's hard to play through my part.
When there's a smell 'round your heart—all day,
Working from soon after dawn
Un-con-scious till they are gone,
With-out shame they turn me on—next day.

Chorus

When lab men act up gay,
I never feel that way
I'm always pant-ing for air and sun-shine.
Am-monia brings a tear
No fancy smells ap-pear
As I go pant-ing for air and sun-shine.
H-N-O_3
Ain't good for me
Chlor-ine gas and H_2-S
I cough, and rasp,
And then I gasp.
Oh what a mess!
I choke with gas and fumes
Yet I can't leave the room
I just keep pant-ing for air and sun-shine.

—Russell C. Erb.

NEWS FROM HERE AND THERE

USE OF SLASH PINE FOR NEWSPRINT SEEN

Predictions that the use of slash pine, easily and quickly grown in the southeast, particularly in Georgia, South Carolina and Florida would revolutionize the cost of newsprint paper and successfully compete with Canadian production of paper, was made by Dr. Charles H. Herty, industrial chemist, in speaking before the Chamber of Commerce meeting in Savannah recently

Contrary to much popular belief, said Dr. Herty, the slash pine is not full of resin or turpentine. The resin content is low. While an excellent gum producing tree it has practically no turpentine content and while admitting that this sounded "crazy," yet chemical tests showed that there was no more resin in slash pine than in the spruce trees of Canada. Turpentine is not in the trees as they stand, he said.

"Some man who has to change his location from the North will put up a paper mill and make paper which he will sell so much cheaper and make so much more money than the man in the cold climate of the North that there will be a rush into the South," said Dr. Herty. "It is proved by figures of the United States Department of Agriculture that trees grow seven times faster here than the Canadian spruce does. Slash pine is the fastest growing of all pines, and what are we going to do? Burn it up every year? Cut down the prospects of being rich? That is what I want you to see. You people in the counties around Savannah, be ready for the men who are going to be down here before many years pass, trying to buy stuff for the mills, for the mills will be located here."

ADRENAL GLAND EXTRACT FOUND FOE OF CANCER

The accidental discovery of two San Francisco doctors that adrenal cortex extract causes disintegration of dangerous and hopeless cancers may prove to be an important additions to weapons of medical science.

So important is this new development in the fight on the cancer that the University of California's medical departments and the Hooper Foundation are mobilizing to aid Dr. Walter Bernard Coffey, chief surgeon of the Southern Pacific Hospital here, and his assistant, Dr. John D. Humber, in further researches on the promising preparation.

An extract made from the endocrine gland, the adrenal cortex, of sheep was being used by Drs. Coffey and Humber to produce lowered blood pressure and they noted that it had a disintegrating action upon a tumor in the same subject. In their preliminary report to the San Francisco Pathologic Society they told how they then used the gland extract in the treatment of three hopeless cases of human cancer, one of the cancer of the tonsil. Graduated doses of the extract were

injected under the skin and necrosis was caused to such an extent that the tumors sloughed and the patients were better temporarily.

The new extract is not yet ready for wide use and much more research must be done to discover its application and limitations. The method of preparation of the extract has not yet been announced by Drs. Coffey and Humber and its composition is not yet known. The adrenals are small organs just above the kidneys.

The work of Dr. Coffey and Dr. Humber is, in effect, a continuation of the line of research reported by Dr. Boris Sokoloff of the Institute of Cancer Research, Columbia University, New York, who at the International Physiological Congress at Boston last fall told of the destructive effect upon cancer of an extract of adrenal cortex mixed with an iron salt and pyroll blue.

—*Science Service.*

HIGH SCHOOLS SHOULD HAVE THE BEST TEACHERS SAYS PHYSICIAN

The best trained educators should be working in high schools, guiding boys and girls through the important stage of adolescence, rather than teaching college students who are not nearly so teachable, in the opinion of Dr. Daniel J. McCarthy, neurologist and professor at the University of Pennsylvania.

"The benficial effect of education in the average student does not extend beyond the eighteenth or nineteenth year," Dr. McCarthy states, basing his conclusion on his impressions from tests made while he was quiz-master in the medical school. "In dealing with the average mind, a specialized type of education in the later years disciplines the mind and thereby increases its efficiency, but does not in crease inherent brain power."

Dr. McCarthy's tests at the medical school showed that students admitted to the medical school from high schools showed as high brain efficiency as college graduates who entered the medical courses. All of these students were from twenty to twenty-four years of age, and their brains were fully formed.

In the ideal educational system, boys and girls in their teens would be taught in small classes by highly trained professors, Dr. McCarthy concludes.

—*Science Service.*

PLANET DISCOVERER TELLS HOW HE DID IT

CLYDE W. TOMBAUGH

Member of the Lowell Observatory Staff and Discoverer of the Trans-Neptunian Planet.

In searching for the new planet I was carrying out a systematically arranged program and was fortunate in being assigned to this work with the splendid new Lowell photographic telescope. I was determined to examine the ecliptic thoroughly and carefully all the way around the sky. In the course of several months of arduous research I had been ever expecting to find the new planet predicted by Prof. Lowell. Examination of plate after plate failed to reveal it, but many asteroids and variable stars were found. I had figured out just how the object sought for should appear. The ecliptic survey was nearly half completed when one day I found an object on my plates that fulfilled expectations. Almost instantly I felt that it was the one looked for, and, of course, felt greatly elated. I was reminded of my sister's class prophecy back in high school days.

The work on the planet, however, is far from finished. Now that it is found, the elements of its orbits, and much else concernining it, must be learned, so doubtless it will be a much observed object. I am not a mathematician, and so the work on the planet is being carried on largely by the senior members of the observatory staff.

I was born February 4, 1906, near Streator, Ill., the son of Muron and Della Tombaugh; received my elementary education in the rural schools and attended Streator High School for two years. The family moved to Kansas in 1922, where I assisted my father in raising wheat. I was graduated from Burdette High School in 1925.

Since then my summer seasons were given to farming, my winters to constructing reflecting telescopes. During recent years much of my spare time was spent in observing with my telescopes and reading astronomical books. In January, 1929, I came to the Lowell Observatory and commenced work with the telescope with which the new planet was discovered..

—*Science Service.*

PROBLEM FAMILIAR TO ANCIENTS STILL AWAITS SOLUTION BY SCIENCE

The strange phenomenon of hay racks catching fire through no human agency was recognized as a natural process by the wise men of old Rome, and yet two thousand years later the process is still as baffling and inexplicable to modern science as it was to Columella and Pliny. Citing the knowledge of ancient observers regarding spontaneous combustion. Dr. Henry G. Knight, chief of the U. S. Bureau of Chemistry and Soils, outlined a program of scientific research, which would solve the mystery and enable mankind to forestall the destructive process. Dr. Knight spoke recently before the Conference on Spontaneous Heating and Ignition of Agricultural and Industrial Products.

"There is evident need of careful investigation of the exact conditions that produce the spontaneous ignition of agricultural materials as the basis for our future course of action," he stated.

"It will require a co-operative investigation by chemists, bacteriologists, and engineers upon quantities of materials sufficiently large to duplicate actual farm conditions."

Outlining the points requiring special attention, he said:

"Chemical analysis should be made of the fresh material and the chemical changes which take place throughout the heating period should be noted carefully . The rate of heating in different

parts of the mass should be determined. The avidity for oxygen of the fresh and fermented material should be studied. The migration of moisture throughout different parts of the experimental material should be carefully observed. The production of gases and their character should receive study. The effects of aeration at various stages of storage should be recorded. Studies of conditions existing in the areas of high heats should be carried on, and the various methods of curing in the case of hay and the effects of aeration at various stages of storage should be recorded. Studies of conditions existing in the areas of high heats should be carried on, and the various methods of curing in the case of hay and the effects of adding other substances such as salt to hay and cattle feed should receive special study.

"Along with this work and based upon it should be studies of methods directed at the reduction of spontaneous heating and actual firing of agricultural materials."

Spontaneous ignition costs American farmers millions of dollars a year, and the chief products which go up in smoke or are spoiled for use by this cause are hay, grain, and horse manure, the chemist stated. —*Science Service.*

UNKNOWN ELEMENT LOCATED IN ORES BY DELICATE PROCESS

With a method so delicate as to detect the presence of a chemical compound when dissolved in ten billion times its own weight of water, Dr. Fred Allison and Edgar J. Murphy, of the physics department of Alabama Polytechnic Institute, have located the unknown element number 87 in two well-known minerals. They will make a preliminary report of their research in the forthcoming issue of the *Physical Review*, official journal of the American Physical Society.

Lepidolite, a form of mica, and pollucite, a mineral consisting chiefly of the elements of cæsium, aluminun and silicon, were the substances studied. As the properties of element No. 87 are known in a general way, even thought it has not yet been discovered, Dr. Allison and his colleague were able to predict its effect. Studies of the substances in four different chemical combinations all showed the effects that should be caused by element 87. This, say the experimenters, "affords evidence of considerable weight for its presence in the sample under test."

The next step will be to extract the element from the minerals, and when this is done it may truly be said to have been "discovered." Then only one unknown element will be left. According to modern conceptions there are 92 elements, numbered from hydrogen, which is number 1, to uranium, number 92. At present the series has two vacant spaces, one being number 87, to which the name eka-cæsium has been tentatively assigned, and which is in the same group as lithium, potassium, rubidium and cæsium. The other undiscovered is number 85, in the same group as flourine, clorine, bromine and iodine, known chemically as halogens.

About seven years ago there were six unknown elements. Then, in 1923, two Danish chemists, Coster and Hevesy, found number 72, which they named hafnium, after the Latin name for their City of Copenhagen. In 1925, Dr. Walter Noddack, at the University of Berlin, with the aid of two assistants, discovered numbers 43 and 75 which he named respectively masurium and rhenium. This was followed in 1926 by illinium, number 61, discovered by Dr. B. S. Hopkins, and named after the University of Illinois, with which he was connected. This was the first element discovered by an American.

—*Science Service.*

ASTRONOMERS PREPARING FOR FIRST AMERICAN ECLIPSE SINCE 1925

The first total eclipse of the sun in the United States since 1925 is the attraction that will bring astronomers from all over the country to positions near on April 28. Then the tip of the moon's shadow will graze the earth along the line crossing the coast of Marin County, California, about 20 miles north of the Golden Gate, travelling northeastwards across the state, passing just south of Marysville and Honey Lake.

Crossing into Nevada about 40 miles north of Reno, the shadow continues over the southeastern corner of Oregon, over Idaho, and then leaves the earth at a point some fifty miles east of Butte, Montana. Only over this narrow line, scare a half mile wide, will the sun be obscured, and the ordinarily invisible corona around it flash into view for a second or so.

This is a very unusual eclipse, or so-called "central" eclipse, the first of its kind in 18 years. Usually, an eclipse is either total or annular. Either is caused by the moon getting directly between the sun and earth. But the distances vary. Sometimes the shadow of the moon reaches to the earth and beyond, and the regions which it crosses see the sun totally obscured. This is a total eclipse. At other times, the shadow, conical in shape, with the point away from the sun, fails to reach the earth. Then the eclipse is "annual;" the moon, seeming a little smaller, does not fully cover the sun, and a ring of sunlight is seen around it.

A central eclipse, like the coming one, is both. Where it starts, out in the Pacific Ocean, it is annular. The earth, being round, bulges several thousand miles towards the moon, so by the time the eclipse approaches the Pacific Coast the tip of the shadow reaches the earth and the eclipse becomes total. But instead of the shadow on the earth being a hundred miles or more in diameter and causing an eclipse lasting several minutes, the shadow in April will be under a mile, and the eclipse at its longest will last a second and a half. Then, after the tip leaves earth in Montana, the path in which the ring of sun can be seen continues across Saskatchewan, Manitoba, Hudson Bay, Quebec and Labrador and ends out in the middle of the Atlantic Ocean, 5 hours 29 minutes and 55 seconds after it began, some ten thousand miles away.

An annular eclipse is of no scientific value, but along the path of totality astronomers will try to make observations only possible at a total eclipse. At Camptonville, Yuba Co., about 125 miles northeast of San Francisco, will be a party from the Lick Observatory of the University of California, under the direction of Dr. J. H. Moore, Dr. D. H. Menzel will be with him. Farther East, near Honey Lake, will be a group from the Mt. Wilson Observatory, in charge of Dr. S. B. Nicholson. On the edge of the Black Rock desert, about 12 miles northwest of Gerlach, Nevada, Dr. Herber D. Curtis, director of Allegheny Observatory at Pittsburgh, will make observations.

Flying in airplanes above will be still other astronomers, Dr. R. J. Trumpler, of the Lick Observatory, will fly in an army airplane, while other observations will be made from planes from the Mare Island navy yard.

Because of the great number of bodies in the solar system that exert a pull of gravity on the moon, its path is a very tortuous one. and astornomers are not able to predict its path with absolute precision. As a result, says Dr. R. G. Aitken, associate director of the Lick Observatory, in a report to the Astronomical Society of the Pacific, "it is still impossible to predict with perfect accuracy the central line of the shadow path at any eclipse. The oustanding error is only a small fraction of a mile, and when the eclipse lasts one or more minutes this is quite unimportant, since the eclipse path is then many miles wide. On April 28, 1930, however, this small uncertainity is serious, and, for all his care, the astronomer may find himself just too far North or too far South to be on the shadow path.

"That is the reason why astronomers at the coming eclipse are planning chiefly to make spectrographic observations of the sun's lower atmospheric layers, known as the chromosphere; for these can be carried out sucessfully and with results of decided value, even if the spectrograph is just outside of the shadow path.

"A photograph of the corona, however, can be taken only at stations on the path. The Lick Observatory-Crocker Expedition, therefore, plans to set up three cameras, one on the computed central line, one about one-third of a mile North of it, and a third an equal distance to the South."

In order to predict the most accurate position possible of the path of the shadow, astronomers at the U. S. Nautical Almanac Office, in Washington, under the direction of Prof. James Robertson, have made a last minute calculation of the path. Using observation of the moon made recently as March 12, they have calculated the path to within a hundredth of a minute of latitude and longitude, or less than a hundred feet. With such recent observations, there should be little wandering of the moon between the last one and the eclipse itself.

MEANS OF TEACHING PUPILS

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In recent years there has been such a violent reaction to memorization and glib reciting of content without understanding, and to abtract presentation of subject matter without the concrete to give it meaning, and to cramming the memory with knowledge without reference to its value or use that educators were compelled to re-think the whole problem of instruction and offer some means for teaching pupils to study. It is impracticable to present in so brief a compass, concrete description of procedures in directing individual study in each subject. Only those procedures will be considered that teachers have found effective.

A rational basis for the enterprise of teaching pupils how to study requires an acquaintance with the psychology of the learning process, the nature of teaching and the desirable outcomes of teaching, the educational value and function of each subject taught, the nature, application, usefulness and limitations of each special form of teaching technique and a sound philosophy of education.

Before bringing into formal arrangements the significant types of study it may not be amiss to make a few trite observations. It is generally conceded that the emphasis in teaching should be on the learning process going on in each pupil rather than on subject-matter. Teaching, says a prominent educator, is only a handmaid of study. "In time teaching should become unnecessary and the learning process should become thenceforth wholly a study process." The correlation between learning and teaching is so close that one may boldly assert that where there is no learning, there has been no teaching or study. This statement is is a paraphrase of Dewey in "How We Think." "Teaching and learning," he says, "are correlative or corresponding processes, as much as selling and buying. One might as well say he has sold when no one has bought as to say he has taught when no one has learned. And in the educational transaction the initiative lies with the learner even more than in commerce it lies with the buyer."

Nutt, in his Principles of Teaching High School Pupils, observes that the real problem of method in education is not method of teaching, but method of learning. If the term could be limited to the learning process and the term technique could be adopted to signify the acts put forth by the teacher in presenting subject-matter to the pupil, it would clarify our thinking about method and remove the vagueness and enable us to improve an unsatisfactory teaching situation

In the task of teaching pupils how to study the following definition of learning from Nutt will be helpful in any type of study. The method of learning anything is through putting forth the mental process of sense perception, memory, imagination, judgment-forming and reasoning with varying degrees of intensity according to the nature of the object, so that the object is first seen as a vague whole,

is next analyzed into its characteristic elements, is then reorganized around its dominant element or elements and this process of analysis and synthesis repeated until the significance or meaning thus obtained is thereafter habitually seen as a distinct or known whole.

The technique of teaching, because of its close relation to both method of learning and devices employed, may be appropriately inserted here. Technique is the skill of the teacher in manipulating the devices so that the psychological processes carried on by the learner are stimulated to effective reactions in dealing with the subject-matter that is to be learned.

The weak spot in teaching pupils how to study is in the traditional, adequate assignment. Nothing that has been said or that will be said can take the place of the assignment for its chief function is to teach pupils to study. Here, the teacher by his enthusiasm, insight, ability and by the very life itself motivates new work effectively, finds an incentive that stimulates to unusual activity, creates such interest, ideals and attitude that study becomes a creative enterprise. Through a proper assignment the pupil sees useful, desirable, attainable ends. He sees the vital relation between what he is doing and his own life and its problems. The purpose and value of his task inspire him to whole-hearted purposeful activity, in getting, retaining and using the great body of facts which the various subjects offer. In the meantime, the pupil is acquiring in the best possible way, the habits and skills, the interest, ideals and attitudes that far surpass mere information as an outcome of teaching.

The chief task of the modern teacher is to direct study, which includes planning, stimulating, motivating, guiding, diagnosing and measuring. Proper and adequate assignment is the golden thread in most of this. The socialized recitation, supervised study, problem teaching and the so-called project method are meaningless shibboleths of education without worthy assignment.

Dr. May in "How To Study in College," gives a comparatively brief but excellent presentation of the five types of study. The following is an inadequate outline of chapters six to ten of the above mentioned book.

The Reading Type of Study

All study from English Literature at one extreme to mathematics at the other, involves reading. In this type of study the teaching by means of the assignment should put the pupil on his mental tiptoes looking for and expecting something. The mental forces should be so focused as to give intense concentration and its necessary concomitant, comprehension.

The comprehension and concentration required to make an outline of the reading helps the pupil to study. The mental recitation or talking back to the book, supplementing the thought of the writer, picking out key sentences, verifying doubtful meanings, setting forth questions to be answered, securing a large vocabulary, are fundamental proccesses in the reading type of study.

The Memory Type of Study

Memory is the basis of all knowledge. It is true, however, that learning, as the definition shows, involves other things beside memory, but memory is the ultimate foundation on which all learning is built. Memorizing is a form of learning, but not all learning is memoring. Memorizing is also a type of studying but not all studying is memorizing. Courses in history, natural sciences, and social sciences require more memorization of facts than courses in English or mathmatics. But mathematics has its axioms, postulates and principles that should be remembered. The requirements of the various courses justify a memory type of study.

The starting point in the memory types of study is a diagnosis of your pupil. The teacher needs to know: the type of mind the pupil possesses, his habits of reading and interpretation as well as his habits of memorization of important material. The diagnosis should ascertain the difficulty in memorizing facts, the length of time it takes to memorize a simple poem, whether the pupil learns easily and forgets rapidly.

In the remedial instruction the four fold process in a complete act of memory should be uppermost in the mind of the teacher.

1. Getting the facts in mind.
2. Process of retention for future use.
3. Process of recollection so as to produce when wanted.
4. Recognition or identifying the facts you wish to recall.

Since the memorization of facts in order to make them a part of the mental equipment is so vital, all other purposes may be omitted for the present. It then becomes unnecessary to deal with the mechanical methods of visualization, code systems, acrostics and probably rhythm as an aid to memory.

The logical method of memorizing demands a complete comprehension of the material learned. Yet it is entirely possible to comprehend and still not remember.

The so-called logical method of memorizing involves at least two things: A careful observation of relationships; and the organizing and outlining of the material. Retention will depend on the constant use and application of the facts that were completely learned while the recall depends on a clue or stimulus, organization and concentration. Failure to recall may be due to a variety of causes. Something else is interfering and inhibiting, or there may be excitement and worry; or a misunderstanding of what is wanted.

Organizing and Collecting as a Type of Study

The laboratory sciences courses will require a maximum of this type of study. Mathematics uses the minimum. Other subjects range between these two extremes. This type of study tends to bring the pupil into first hand contact with the facts and causes him to learn by doing.

Acquaintance with the technique of collecting and organizing information should be emphasized so that the collecting will not become a substitute for study. Since the collection and organization of data from the three sources require a different technique, a definite training should be given in collecting information from books and written material. Information from lectures, recitations and oral

material requires a different procedure. Gathering information from observation and laboratory involves a *discussion* of scientific method which is beyond the scope of this endeavor; yet the laboratory attitude of constant inquiring and questioning which provokes study can not be too strongly stressed.

The teacher should give definite rules for notes and note-books; use a technique of instructing in science so that the pupil may develop the laboratory attitude. In organizing facts; in securing basis of classification, the making of a tentative outline and the selection of proper headings will contribute to the mental activity and study life of the pupil.

The Problem Solving Type of Study

Studying is not only getting and retaining information through comprehension, understanding and organization it is also a process of applying information to practical problems.

Problem solving is such an important activity in every phase of living that it is criminal to refuse to give it a place in our classrooms. The use of problems is not restricted to any one teaching plan. The chief essential is putting the pupil in a problematic attitude towards his school work,, causing a dissatisfaction which can be satisfied only by the solution of the assigned problem. The effort and the thinking necessary for a satisfactory solution not only give information but they give desirable attitudes, habits, skills, interests, and ideals. Dewey in "How We Think," gives the four steps involved in the problem solving process. Lack of space forbids the enumeration and illustration of these steps.

The Drill Type of Study

"All motor learning, such as learning to use a typewriter, is habit formation, there is no essential difference in process between learning to multiply and learning to write. Each depends on certain nervous structure and functions. Habit formation is a type of study. When a fact is learned so completely as to become a part of your mental equipment it takes on the form of a habit.

Drill work is essential for fixing information, establishing mental and study habits and for perfecting necessary skill. In all subjects there are certain phases that require more or less drill for skill and habit formation. Good study habits of place, time, position, duration of study together with habits of concentration, outlining, summarizing and reviewing should be the objective of every teacher and the achievement of every pupil.

In training pupils to study by the drill type insist on practice on specific things to be acquired so as to get efficiency and satisfaction to the learner. A brief discussion and emphasis of the laws of learning will be just as helpful in this connection as the various suggestions for securing a satisfactory outcome.

The law of use, in all of its aspects of frequency and recency; the law of effect and intensity, association, appreciation and readiness operate in the drill type of study just as they do in acquiring and retaining information.

The value of right study habits is productive of such good results and the dangers of wrong study habits are so destructive that we can all afford to cultivate a few fundamental habits of study; such as a carefulness in effort; clearness in ideas; cheerfulness in the attack of problems; a critical attitude in study; dispatch in completing the task; decision in daily assignments; endurance if it is practicable to complete the undertaking; neatness in work and regularity in following schedule.

The five types of study given will become lifeless forms, deadening rules, mechanical routine and pedagogical dogma unless with sustained fascination and interest, they arouse energetic action by directing the pupil towards desirable and attainable goals, developing at the same time habits, thirst for knowledge, and a desire for personal excellence. Just as in all reflective thinking the mind is bent on solving a problem, or finding the means of perplexing affair or reaching a trustworthy conclusion.

So in all study there must be a problematic situation which challenges and inspires the student to creative thinking. This is study of the highest type.

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A UNIFORM GRADING SYSTEM FOR HIGH SCHOOLS

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One of the reasons for such wide variation in the assignment of marks to the school work done by students is the wide difference in meaning given to marks by teachers. There can be no uniform marking system unless there is first a common understanding of the meaning and significance of a marking system. A marking system may be perfect, but if it is not used scientifically for the purpose for which it has been designed, there can be no uniformity in its use.

A marking system is a scale of values used as a standard by which the achievement of the student is measured. The mark assigned a certain piece of work should indicate how much of the assigned work the student has done and also how well the work has been done. Marks then are measures of both quantitative and qualitative achievements. Marks may not be true standards, but the chief aim of marks is to indicate the quantitative and qualitative achievements of the students.

One serious mistake often made in the assignment of marks is that of grading the student, his conduct and personality, instead of grading the student's work. Before there can be a uniform marking system or before a uniform marking system can have any significance there must be a common recognition of the fact that conduct and certain qualities of personality, whether they be likeable or unlikeable qualities, are entirely apart from what the student puts on his paper. Therefore the student's work and not his conduct or personality should be graded. His conduct and personality should be dealt with apart from his achievement in his subjects.

There are many marking systems and several which seem to be commendable, but the one that seems most commendable and most widely used is the letter system which follows:

A. Excellent.
B. Good.
C. Fair.
D. Poor, but Passing.
E. Conditional Failure, Incomplete, etc.
F. Complete Failure, (requiring repetition or dropping of course.)

In this marking system there are four distinct passing grades, A, B, C, and D. There are two grades representing failure. The *E* represents a conditional or temporary failure, which may be made up as the instructor see fit without repeating the course. The "F" is a complete failure and must be repeated, or the course must be dropped.

The letters indicating passing grades represent four distinct steps on the grading scale above the passing mark 70. On the grading scale A or excellent ranges from 93 to 100, B or good ranges from 85 to 92, C or fair ranges from 77 to 84, and D or poor ranges from 70 the passing mark to 76. Thus the marking system follows.

A.	Excellent	93-100
B.	Good	85- 92
C.	Fair	77- 84
D.	Poor	70- 76
E.	Conditional Failure.	
F.	Complete Failure.	

A student receiving a majority of "A" grades and a few "B" grades may well be considered as falling in the highest third of his class. A student receiving a majority of "B" grades and one or two A's or C's may be considered as falling in the middle or lower third of his class. A student receiving a majority of "C" grades and a few "D" grades may be considered as falling in the lowest third of his class.

In the use of this marking system the distribution of grades should tend to follow the normal probability curve. That is to say, no teacher should give an exceptionally large number of any one group of the grades to a class, but the grades should be fairly well distributed, approaching in any normal size or large class such a distinction as follows.

A. 7%; B. 24%; C. 38%; D. 24%; F. 7%;

This distribution should not be adhered to unwisely; it should merely serve as a guide in distributing marks.

In calculating honors the point system may be used, assigning a certain number of points to each of the passing grades as follows: A=4 points; B= 3 points; C=2 points; and D=1 point. To get the student's average divide the number of points secured by the number of units secured and the results will indicate the average grade in terms of points.

A HAPPY DEVELOPMENT

STORY OF COUNTY TRAINING SCHOOLS

By JAMES H. DILLARD

President of the John F. Slater Funds, of the Anna T. Jeanes Fund, and Vice-President of the Phelps-Stokes Fund

This story might easily be full of statistics, but I shall not try to be profuse in figures. Some days ago I read the following lines in a religious weekly, in an article dealing with certain church statistics which had recently been issued. As the lines were found in a religious paper the profanity must be pardoned:

Figures must be
Properly compiled,
Adequately presented,
Thoughtfully interpreted,
And even then they lie like hell.

So I shall give only a few outstanding figures, and I may tell at once the two sets that are most striking. In the session 1911-12 when the so-called County Training Schools began, there were four, and received from public tax funds $4,344. In 1928-29 there were 370, and received from public tax funds $1,886,852. The total receipts for these schools in 1928-29 amounted to $2,201,407.

The way they began is interesting. In the Spring of 1911 two unusual letters came to the Slater Fund. I say unusual, because this Fund had been dealing with private and denominational institutions. and the two letters came from county superintendents of public education. One came from Virginia, the other from Louisiana. They said practically the same thing. Would the Slater Fund help in building up a central school in the county? It was hard to get teachers for the one-room rural school, and a local, even if it went only to the eighth, ninth or tenth grade, was needed to meet the demand. I could understand this. Two years before the receipt of these letters I had made a personal survey of colored schools in a small county in Mississippi. Of the twenty-seven public school teachers in the county there were only three who had themselves studied above the fifth grade. Let me say here that nowhere would such an absurd condition now be found, but this was eighteen years ago. The proposition of the two superintendents might seem merely a makeshift, but it sounded good enough to try, so the reply was that the Slater Fund would be glad to co-operate. In the following session a beginning was made in four counties.

In the next year there were still four. In March, 1913, a letter was written to the State Superintendents of the South, explaining the plan and quoting from a report I had made to the Trustees of the Slater Fund. This letter called out most encouraging replies. I give a few extracts, because they are an important part of the story. Hon. Henry J. Willingham, of Alabama, said: "I shall approve and foster at every opportunity the plan outlined in your favor of the 27." He went on to say that he would bring the matter to the attention of county boards. "The county boards," he wrote, "are the men who

hold the strategic point in bringing about such an arrangement." Hon. W. M. Sheats, of Florida, wrote: "Yours of March 27th received. I am willing to co-operate with you to the fullest extent . . . Your policy and plan meet with my highest approval." Hon. J. Y. Joyner, of North Carolina, wrote: "I approve most hearitly your suggestion of a county industrial training school for Negro teachers. . . . I will take the matter up with Mr. Newbold as soon as he takes charge of the work of supervising the Negro rural schools of the state, and co-operate with him in endeavoring to interest the county superintendents and county boards of education in this proposition." Hon. J. W. Brister, of Tennessee, wrote: "I should be glad to see this central school idea worked out to which you refer where we could give better educational opportunities to Negro students than can now be had in the ordinary small schools, and if you could make a suggestion to the county superintendents I should be glad to follow up that letter and encourage them to take advance steps where they are possible." In the session 1913-14, the number doubled. In 1914-15 it doubled again, becoming seventeen. Since then it has gradually and steadily increased.

The extract from Superintendent Brister's letter suggests another consideration which caused a favorable reply to the two county superintendents. Here seemed a clear lead for the promotion of public high schools for colored children. The time seemed at hand, or soon coming, when the need would be apparent. If the colleges were to prosper there must be a supply of secondary schools, and a proper supply could come only through the means of public funds. The establishment seemed therefore not only to meet their immediate demands but to point further. And so it was. In fifteen years, that is, by 1926, when there were 306 such schools, there were eighty-two which had reached a full four year high school course. They are all on the way.

An investigation just completed shows that in a fairly complete list of private and denominational schools the number of high school pupils in such schools has declined, within the past four years, from about 35,000 to about -9,000. This, of course, does not signify that there are fewer high school pupils. It simply means an increase of the number attending public high schools. In these four years twenty-seven private or denominational schools have closed, some to become County Training Schools, others because of nearness to such schools. This is inevitable, but it by no means implies the extinction of private and denominational high schools. There are some which ought to die, such as are lacking in genuineness and in any reasonable expectation of proper support. But there will always be plenty of room and need for high-class high schools conducted privately or by the various religious denominations, and such deserve far more assistance than they are at present receiving.

In the beginning, of course, none of the Training Schools were High Schools, and we did not wish to call them such. Even at that time there was some criticism of false names. A University was cited which had never gone above the third high school year, and there

were many colleges which did little more than the beginnings of high school work. So the name of County Training School was hit upon. The suggestion came from Dr. J. D. Eggleston, former State Superintendent in Virginia, later President of Hampden-Sidney College, and also a member of the Slater Board. The idea was that when the schools should become high schools they might be so called. Some of them have thus graduated out of the Training School list, and changed the name, but there are others which though they are entitled to the change of title, still keep the name of Training School.

It sometimes happened that a County Training School served not only its own county but some adjoining county. A Jeanes Teacher, going about among the rural schools, would fine bright pupils who ought to have a chance of passing beyond the five or six grades provided. She would tell about the Training School and perhaps bring about the chance of going. If it were too far away, perhaps there might be some relative living near it, with whom the child could board. Some of the schools soon began to have modest dormitories. By 1925, when there were 233 schools, there were fifty-seven which had dormitories of some kind. In that year there were 6,198 boarders, of whom 1,657 were in dormitories, the others in near-by homes. In more recent years the tendency has been toward transportation.

Co-operation has become a great word in our day. In really effective co-operation in the field of education the County Training Schools furnish the most striking example that I know of. Let me give one instance of one of the schools which I recently visited. This school had received help from seven sources: the State, the county, the contributions of the people themselves, the Slater Fund, the General Education Board, the Rosenwald Fund and the Federal Fund, known as Smith-Hughes. This last was supplying the salary of a teacher in agriculture and shop work. The General Education Board had supplied most of the money for a shop building. The Rosenwald Fund gave a part of the money for a new main building. The Slater Fund was helping in the payment of Salaries. Beside all these agencies the Carnegie Corporation made through the Slater Board liberal contributions to County Training Schools in the critical middle period of their development.

After all these schools being public schools, their main development has come from public school funds. This is a great fact, and it is a fact which, even in thinking of race relations, counts for more than many orations as evidence of growth in conviction of justice and spirit of good will.

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