lief that we can have a science of direct experience. Scientific facts come out of experience, but they are then no longer in it. Science does not attempt to reconstitute experience; it builds up inferentially a world of constructs which are its realities.

A careful examination of the introspective process shows that introspection, like any other observation, is the taking note of symbols that mean occurrences in this constructural or real world.

We are, therefore, free to examine these symbols, the phenomenal data of introspection, to see what they can symbolize with the greatest profit for scientific psychology; and we conclude that neural events are the sort of mental constructs that introspective data most effectively "intend."

We can then set out to test this view, to see what it will yield us in the way of a physiological psychology. Such a view is necessarily subject to test and to correction, in the same way that a galvanometer is subject to test and correction as to how it means or "intends" the strength of an electric current.

When we go to the physiological theories of psychologists (and of some physiologists, too) we find many views consonant with the thought of the present paper, as indeed we could have known from the start, since the paper has been written to explicate and evaluate these views.

In general, the most plausible theory of the brain seems to be that the four conscious dimensions find reality there in four physical dimensions of intensity, extensity, duration, and an uncertain fourth which must have an immediate dependence upon the physical variable for quality in the stimulus.

Such a general view is most definitely explicable for intensity. Sensed intensity must represent degree of excitation in the brain. Such excitation does not, however, have to be localized at a single place at a single time, except that it must all be effective in producing a simple subsequent neural event, which is the first physiological term of the introspective process.

In respect of extensity, the notion that introspection tends approximately to mirror the brain is, at the present day, a plausible view and a useful one. A more conservative physiology not only leaves one without an hypothesis for most of the facts of space perception, but implies certain limitations which are contradicted by the facts.

Finally, in urging this view upon you for serious consideration, I would make bold to remind you that scientific hypotheses and scientific truth are temporary and provisional, and that hypotheses that are false to-day have been largely instrumental in leading us to what is true to-day. However, I doubt if a false hypothesis ever led far toward the truth unless it was at the time believed to be true. You have in that statement both my admonition and my apology.

SCIENTIFIC EVENTS

THE MASTER'S DEGREE FOR POSTGRADUATE STUDENTS IN THE MEDICAL SCHOOL OF COLUMBIA UNIVERSITY

ACTION to establish higher standards in the practice of surgery and other specialties of medicine has been taken by the Columbia University Council. Dean Willard C. Rappleye, of the Medical School, characterized the step as having "important significance of a public character." He said:

> The university has adopted a standard of training in each of the clinical specialties, successful completion of which will carry the degree of master of science. The university, however, will not grant recognition for postgraduate training for less than that which will qualify the man as competent in the specialty concerned.
>
> The time will come in this country, as it has in others, when the public and the profession will demand that only those who are properly trained to do major surgery, for example, will be permitted to do it. At the present time large numbers of doctors are doing surgery who are quite incompetent and untrained.

The new regulations for the degree of master of science in postgraduate medical education follow:

The university grants recognition for acceptable postgraduate work in the clinical specialties by means of the degree of master of science.

This degree is non-specific, that is, it does not carry a designation of the special field of study to which the student has devoted himself. Only a broad definition of requirements is stated in order to permit flexibility in the training for the various clinical specialties and adaptation of that training to the needs and preparation of each student. The specific requirements for each of the specialties are formulated by the departments concerned.

A student who wishes to secure the degree of master of science in postgraduate medical work must present evidence of graduation from a medical school approved by Columbia University, and completion of an internship of not less than one year after graduation in a hospital approved by Columbia University.

Students who offer work pursued in other universities, laboratories or hospitals for part fulfillment of the requirements for the degree of master of science as hereafter set forth, should file a certified statement of such training with the director of university admissions for evaluation.

A student admitted to the university for postgraduate medical studies who wishes to become a candidate for the

degree of master of science will be registered upon recommendation of the department in which his work is to be done.

The requirements for the degree of master of science are:

A period of study after the internship of not less than three years in the university or in hospitals and laboratories recognized by it, at least one calendar year of which must be spent in this university.

Such intensive graduate training in the basic medical sciences of anatomy, embryology, physiology, biochemistry, pharmacology, pathology, bacteriology, and in other fields of science as shall be recommended by the departments concerned and approved by the Administrative Board on Postgraduate Studies in Medicine.

An active experience during the three-year period of not less than eighteen months in the hospital, clinics and diagnostic laboratories of the specialty elected.

Written, oral and practical examinations and a dissertation may be prescribed in the specialty elected and in clinical, laboratory and public health fields to which the specialty is related.

A student admitted to the university for postgraduate medical training may become a candidate for the degree of doctor of philosophy if he meets the requirements for that degree that are prescribed by the faculties of political science, philosophy and pure science.

FURTHER INVESTIGATION OF COSMIC RAYS

PLANS for a concerted effort to discover the source and nature of cosmic rays, involving the measurement of these radiations at eighteen widely scattered sites on the earth's surface, are disclosed by Dr. Arthur H. Compton, professor of physics at the University of Chicago.

During the spring and summer of 1932 more than a dozen physicists, working in several parties under the direction of Dr. Compton, will test the intensity of the rays at thirteen sites. Electrometer readings, taken largely in mountain ranges, will be made in Panama, Peru, New Zealand, Australia, Hawaii, Alaska, the Argentine, Chile, Kashmir, Ceylon, Singapore, Java and South Africa. The Carnegie Foundation and the University of Chicago will share the expense of the study.

The present expeditions continue the work which Professor Compton and his collaborators carried on last September and October on Mount Evans, Colorado, and on the Jungfrau in the Swiss Alps. The projected measurements will be made at widely distributed stations and at different altitudes on mountains ranging in height from 7,000 feet to 26,000 feet.

The objective of the expeditions, according to Dr. Compton, is "more complete knowledge of the nature and place of origin of the cosmic rays. A survey such as this should give the most adequate test that has yet been devised to distinguish whether the cosmic rays are photons, such as light and x-rays are, or electrons, such as give rays to the earth's aurora. Because of the effect of the earth's magnetic field, electrons should give less intense rays near the equator than near the poles. Likewise, if the cosmic rays have their origin in the earth's atmosphere there should presumably be variations with the geographical location."

Dr. Compton, who for several years has been measuring the rays in Eckhart Hall on the campus of the University of Chicago, will himself do a considerable share of the proposed work. Accompanied by his wife and his 14-year old son, Arthur Alan, who assisted him in the work on Mt. Evans, Dr. Compton will leave for Panama in March, to make tests on Mt. Chico, fifty miles from the Canal. His next stop will be Peru, where he will work in cooperation with the Carnegie station at Huancayo, making measurements over as wide a range of altitudes as possible and especially at very high altitudes.

Mt. Cook in New Zealand will be the next objective of the party, and the fourth point of observation will be Mt. Kosciusko between Sydney and Melbourne in Australia. From there Dr. Compton will proceed to Hawaii to set up his apparatus on Mauna Kea in Hawaii, and will then go on to Alaska, where Mt. McKinley has been chosen as the experimental site. Late in the summer Dr. Compton will return to America to join Dr. J. C. Stearns, of Denver University, and Dr. R. D. Bennett, of the Massachusetts Institute of Technology, both of whom have cooperated with him in previous cosmic ray studies, and will have spent the summer of 1932 in making further measurements in Colorado.

Three other cooperating parties will report to Dr. Compton at the end of the summer. One will take measurements on the Volcano Lanin in Patagonia and at Punta Arenas in Chile. A second, in charge of Professor S. N. Naude, recently a research fellow at the University of Chicago and now on the faculty of the University of Cape Town, will climb Mt. Winterhoek in South Africa, and will probably measure also the cosmic rays at Mt. Brukkaros.

In India, Professor J. N. Benade, of Punjab University, Lahore, will go to Mt. Nunga Purbat in Kashmir, the third highest peak in the world, and will, if possible, make tests at several altitudes ranging as high as 20,000 feet or more. Professor Benade will then proceed to Kandy, Ceylon, Singapore, Straits Settlement and Mt. Tjerimai, Java, for further measurements.

Negotiations are also being made with several independent groups, which are planning expeditions to