

century, a considerable part of the developments during the eighteenth century, and a very minor part of later developments. The unequal emphasis which such a section would thus place on the different chapters in the history of mathematics would be partly compensated by the fact that it would prepare the way for a more sympathetic attitude towards mathematical history in general.

If such a section is formed it should be understood that the more technical and perhaps the more important part of the history of science is of such a nature that it can be appreciated only by the specialists in the fields to which it relates. There is, however, a great need for work on intercommunicating roads in science and such a section might tend to improve these roads.

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#### VITAMIN TESTS WITH CHICKS

OUR experience recently with the use of chicks for the purpose of demonstrating to classes in elementary physiology the rôle of vitamins in a diet has been so satisfactory that we thought it might be of interest to other teachers.

The day-old chick is so universally available, so easily reared, and its growth is so rapid that it makes an admirable laboratory animal for such a demonstration. Because of their hardiness Leghorn chicks were selected and divided into two groups of equal number and weight. Both the control group and the one to be tested (such chicks being easily marked with dye) were placed in the same large cage with free access to water, grit, shell, etc. Both groups were allowed to partake freely from food kept in a feeder. The food thus accessible consisted of either highly milled corn-meal, crumbs of unleavened white flour bread, or cakes baked from rice flour, or combinations of any or all of these. Changes were frequently made so that the chicks ate readily of the food furnished. In addition to this the normal or control group was fed once a day with small amounts of food containing vitamins.

After the second day the curve of the daily average weights showed a marked difference between the two groups. After approximately two weeks the one group began to exhibit the typical symptoms of lack of vitamins. Death occurs so promptly in the young chicks after the onset of symptoms that care must be taken to at once feed the ailing chicks with vitamin containing food. Small amounts of milk, scraped apple, lettuce, etc., sufficed to cause prompt recovery with marked acceleration in the rate of growth.

We of course recognize that no new results have been achieved but felt that the method of demonstration was worthy of note.

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#### QUOTATIONS

##### THE BRITISH AIR-FORCE ESTIMATES AND AERONAUTICAL RESEARCH

THE development of military aviation has been one of the wonders of the war, but we have naturally been kept somewhat in the dark as to the exact extent of such development while the war was still in progress. The veil has now been lifted, and General Seely, in speaking on the Air Estimates in the House of Commons on March 13, has given us a striking summary of the progress made during the past four years. The fact that the expenditure on the Air Force has increased two-hundred-fold since the outbreak of hostilities is a sufficient comment on the enormous advances that have taken place in the aeronautical world. General Seely states that if the armistice had not been signed, this year's estimates would have reached the sum of £200,000,000—an amount which is practically four times our pre-war expenditure on the entire navy! Even with the signing of peace in sight the sum of £66,500,000 is asked for, in order to ensure the maintenance of the aerial supremacy which we have gained during the war.

It is exceedingly gratifying to note that the true value of research is at last being appreciated, and the specific provision of £3,000,000

for "civil aviation, experiments and research" will be welcome news to those who hope for the scientific development of commercial flying. General Seely further points out that this sum does not by any means represent the total amount that will be spent on research beneficial to the civilian aviator, since the results of experiments carried out for military purposes and paid for out of the Army Estimates will be equally available for the improvement of commercial machines.

The government has decided that it can not itself undertake commercial flying, but that it will do everything in its power to give encouragement and protection, and it is already announced that the Postmaster-General is prepared to give contracts to private firms which are able to offer approved machines for postal services. Moreover, the government will place most of the military aerodromes of the country at the disposal of civilian pilots for a small fee, and this alone should do much to encourage civilian flying.

In the course of his speech General Seely announced that an important invention in wireless telephony had recently been made, by means of which the wireless operator in an aeroplane was able both to send and to receive messages. It was possible during the war for the leader of a scouting aeroplane squadron to communicate with the others, but it was not practicable to receive an answer. A vacuum valve generator was employed to generate smooth oscillations in the hanging aerial, and a vacuum valve magnifier with a crystal rectifier was used as the receiver. The experimental apparatus was in use in pre-war days, but it required years of research to make it practical and trustworthy.—*Nature*.

#### SCIENTIFIC BOOKS

*The Place of Description, Definition and Classification in Philosophical Biology.* By PROFESSOR WILLIAM E. RITTER, in "The Higher Usefulness of Science and other Essays" (4th essay). Richard G. Badger. 1918, Pp. 105-136.

Few of those who have sometimes harbored mild inward protests against the expansions

of subjective biology implied in the organization and interpretation of many of the experimental researches of the day realize the cogency of their unexpressed protests. That accurate thinking regarding biological fundamentals is of first importance for the proper direction and development of biology, science and even of civilization itself is suggested by Professor Ritter in a significant article which has not received nearly the attention it deserves.

Summarily stated Professor Ritter's thesis is as follows: Taxonomy has by many been set aside "as marking a juvenile period in the life of biology"; this appraisal of taxonomy involves a monstrous fallacy; the dominance of individual scientists animated by this mistaken attitude toward systematic zoology and botany has led to unfortunate consequences, both in the development of science and in that of civilization itself.

In science it has given rise to a state of affairs in which the experimental method has been raised to the high place of an end in itself, and has apparently been the stimulus to an extreme of speculation which is perhaps best exemplified by the theoretical conceptions of the German Weismann. In philosophy it has led to the doctrine of the superman, best exemplified in the writings of the German Nietzsche.

On the basis of the assertion that "taxonomic research in both zoology and botany has for years, so far as it has been based on morphology exclusively, taken as one of its guiding principles *neglect nothing*," Professor Ritter goes on to suggest that we can no longer properly restrict our dictum of "neglect nothing" to morphological attributes alone, "but must extend it to all attributes of organisms whatever—morphological, physiological, ecological, chemical and all the rest." He is of the opinion that a comprehensive review of the whole range of biological results won during the last twenty-five years indicates that each of the main provinces of research "contain differentia corresponding to the systems of classification previously established on the