

called especial attention to the deviations from the normal in the mitotic changes in the cancer tissue cells. But Dr. Metcalf's statement, "Boveri's studies of double fertilized sea-urchin eggs established the probability that human and other animal cancer is essentially a distortion of the numerical relations of the chromosomes in the cell," must not be construed as an opinion by Boveri himself. Boveri merely called attention to the peculiar chromosome figures in cancer tissue, an observation verified by every *student* of cancer since then. Particularly striking are these figures in the sarcomas of the young.

Anyway, the important thing is, what is the cause of cancer and how may it be controlled or prevented? It is rather deplorable that Professor Metcalf's search, "extending over fifteen years," has not brought to light one American physician who knew of Boveri's researches.

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THE AVOCADO AND VITAMINS

IN a recent pamphlet entitled "Calmin Avocado Orchards," distributed by the Calmin Mortgage Corporation of Fallbrook, California, it is stated, in regard to the avocado (page 15) that "Vitamin C is also found in liberal quantities."

In a series of twelve guinea pigs, of various weights, fed in our laboratory on a diet of avocado mash, oats and water, all the animals but two developed some of the typical lesions of scurvy within twenty-six days. All the animals died toward the end of the third week, or in the fourth week, of the disease, save the two dying at twelve and fifteen days of bronchopneumonia, these two showing no evidence of scurvy. The average daily intake of avocado mash varied between three to six gm. for one hundred gm. of initial body weight. No relation was noted between the amount taken and the severity of the lesions. Four control animals, fed on oats and water, also developed the signs and lesions of scurvy during the third and fourth week, at about the time scurvy usually appears in laboratory animals.

Santos (*Amer. Jour. Phys.*, 1922, 59: 310-334) found the avocado, a fruit that is eaten raw, to be relatively high in vitamin B. He also endeavored to determine the vitamin C content, realizing the practical value of this vitamin in foods that are palatable in the raw state, but he was unable to get the guinea pigs to eat the fruit.

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THE VELOCITY OF GRAVITATION

IN SCIENCE for November 26 on page 525 a method is described for measuring the velocity of propagation of gravitational potential. I wish to point out that this method can not give the result desired because the apparent motion of the sun in its diurnal arc is due to the rotation of the earth. The experiment proposes to find the local apparent time of the maximum vertical component of the sun's gravitational attraction as measured on a delicate balance. But since this attraction is a continuous process (as is the emission of radiation from the sun) the maximum vertical component must necessarily occur when the sun is on the meridian, that is, at local apparent noon, whatever the velocity of gravitation may be.

Although the speed of light is finite, the real sun is of course directly on the meridian when we see it there, and would be there no matter what the speed of light might be.

CARL T. CHASE

"METABOLOGY"

DR. MAX KAHN has added three words to the vocabulary of metabolism which have since been incorporated in the standard medical dictionaries. They are: "eubolism," "dysbolism," "pathobolism" (*SCIENCE*, June 20, 1922).

The growth and study of metabolism has progressed so much that I believe the vocabulary can be increased by the addition of the term "*metabology*," or the study of metabolic processes in the organism. This word does not appear in current medical dictionaries.

MORRIS H. KAHN

SCIENTIFIC BOOKS

Aeronautical Meteorology. By WILLIS RAY GREGG, A.B., meteorologist, U. S. Weather Bureau, fellow American Meteorological Society, fellow Royal Meteorological Society, Ronald Aeronautic Library, C. de F. Chandler, Editor. The Ronald Press, New York, 144 pages, XI plates, 33 figures. Price, \$2.50.

THE editor of this library series remarks that we need progressive literature of aerial navigation, technical information for designers, engineers, pilots and the growing army of students. This is all true, but at the present time much more is written about the machine than about the medium in which the machine is to function; that is to say, study of the air itself is subordinated to study of the airplane. Perhaps this is proper; but the reviewer for one is glad to

see a book giving information on the behavior of the air, for the benefit of airmen. There can be no doubt of the utility of such a volume, and both the editor and Mr. Gregg are to be congratulated on the publication of a book that for the present meets the need. There is no valid reason why every pilot should not be well versed or at least fairly familiar with the more frequent types of air structure, the processes of cloudy condensation, the formation of fogs, ice-storms, hail-storms and thunder-storms, the shift of wind direction with increasing height, the significance of a change in velocity, the nature of a zone of discontinuity and what it portends, the frequency of favoring and unfavoring winds, the average height of clouds, the meaning of each type and its growth or dissipation; and in short, as much as possible of what Sir Napier Shaw calls "The Air and its Ways," with particular emphasis on the "ways." We group them all under the general term aerography—the science of air structure. No land explorer should be without a knowledge of geography, no seaman scorn a knowledge of hydrography, neither should a flier be without a knowledge of aerography.

There have been decided changes in our knowledge of the structure of cyclones and anticyclones. By persistent recurrence to his idea of thermal stratification of the atmosphere, Shaw has brought us to new conceptions of cyclonic structure, and we now rule out former notions of intruding, rising warm air and the condensation of vapor, as the prime movers in a cyclone, and on the other hands descending dry cold currents as the essential feature of an anticyclone. This old idea of a cyclone, says Dr. Simpson (Address, Section A, British Association for the Advancement of Science, August, 1925) was tersely expressed by Sir Oliver Lodge in a letter to the *Times* last year, as follows:

A cylindrical vortex with its axis nearly vertical rolling along at a rate conjecturally dependent partly upon the tilt and with an axial uprush of air to fill up a central depression which depression nevertheless was maintained and might be intensified by the whirl, the energy being derived from the condensation of vapor.

But unfortunately for the theory, observation does not sustain it. The air does not move in a continuous spiral, and there are decided discrepancies in the distribution of temperature. Air streams are discontinuous and seem to retain their temperatures. Rain does not fall where it should according to schedule; and so we come to explanations based more upon energy derived from readjustment of the center of gravity of the air mass as a whole, the whole being made up of blocks of air of diverse origins.

Here is where observations in strata one thousand

meters and more above the earth become so important, and where knowledge of the vertical structure lets us understand what is really taking place. The diurnal range of temperature, for example, so characteristic of surface readings, fades out at about one kilometer.

Gregg gives with some detail charts showing average temperatures, pressures and densities at the 3 km level, for the United States, east of the Rocky Mountains.

The chapters which most directly bear upon aviation are those on the "Winds" (Chapter IV), and Chapter IX on "Forecasting."

At the surface the air does not flow parallel to the isobars because of friction and viscosity, so that one must rise about five hundred meters to find the gradient wind, or wind parallel to the isobars. But the gradients aloft may be and generally are not in close agreement with surface readings, hence the winds will also change in direction and intensity.

The shifting of winds with altitude into a westerly quarter is shown in detail. With regard to changes in velocity, it is shown that there is a marked increase from the surface up to five hundred meters, then a more gradual increase, and decided seasonal variation in the upper levels.

At usual flying levels the wind factor is 3.5 meters per second; and in the author's opinion it is now possible to fix schedules for aircraft that can be guaranteed any desired percentage of the time—so far as winds are concerned.

There are some good reproductions of cloud photographs. The typography and general make-up reflect credit upon the Ronald Press Company.

ALEXANDER McADIE

SPECIAL ARTICLES

THE EFFECT OF SODIUM SILICOFLOURIDE SPRAYS ON THE PEACH AND ON THE CONTROL OF BACTERIAL SPOT

SOME preliminary experiments by the writer during the summer of 1925^{1,2} indicated that sodium silicofluoride in dilute solution (two pounds to fifty gallons of water) had a decided effect in checking the bacterial spot of peach on the leaves. Unfortunately there was no fruit on the trees, and it was not until the summer of 1926 that the action of this chemical on the fruit could be studied. The results this year confirmed those of 1925 in so far as control of the disease was concerned and interesting information on a unique effect on the fruit was secured.

¹ *Phytopath.* 16: 79–80, 1926.

² *Trans. Ill. Hort. Soc.* 59: 266–272, 1926.