creases in price, especially since the United States entered the war.

The total output of coke and anthracite pig iron in the first five months of 1917 was about 15,800,000 gross tons, compared with about 16,175,000 tons during the corresponding period of 1916, a decrease of about 2 per cent.

The quantity of iron ore from mines in the Lake Superior region shipped from upper Lake ports from January 1 to June 1, 1917, was about 6,500,000 gross tons, compared with slightly more than 10,100,000 tons for the corresponding five months of 1916, a decrease of about 3,600,000 tons, or more than 35 per cent. This apparently large decrease in ore shipments from the principal producing region was not due to inability to mine ore but largely to the belated opening of Lake traffic because of ice blockades and to many ore-carrying boats having been put out of commission through accidents.

Plans are being made by committees of the Council of National Defense to increase shipments of iron ore, coal and coke during the remainder of the season through cooperative methods, and possibly the June shipments will nearly equal those of June, 1916. In the meantime the blast furnaces have been drawing on large stocks of ore at lower Lake ports in order to offset the deficiency in upper Lake shipments. Deferred shipments of coke and other causes of traffic congestion have also retarded operations at some furnaces.

Prices of pig iron at western Pennsylvania furnaces have advanced since January 1, 1917, 61 to 77 per cent. and since a year ago 134 to 200 per cent. On July 3, 1917, basic iron was quoted at Valley furnaces at $52 a ton, Bessemer iron at Pittsburgh at $57.95, and No. 2 foundry iron at $55, while at Birmingham, Ala., foundry iron, which one year ago sold at $14 brought $47 a ton. Low-phosphorus iron has been quoted at $70 to $80 a ton. Feverish buying of pig iron by private consumers who were endeavoring to provide for their present needs, as well as for their needs far into 1918, has caused much of the recent increase in price. The extent of the government's war needs for steel is not yet defined, but increasing. Orders are being placed slowly, however, and they should not interfere seriously with deliveries of steel to private consumers. As the government is not competing in price it would seem that there may be at least some warrant for belief that prices may eventually adjust themselves without need for further great inflation.

METEOROLOGY AND AERONAUTICAL ENGINEERING[1]

Introductory: Importance of meteorology in aviation; aircraft and weather in war: (*a*) general climate; (*b*) weather and weather forecasts: military field meteorological services.

The Atmosphere: Composition; height; "troposphere" and "stratosphere": general characteristics of each.

Temperatures in the Free Air: Vertical temperature gradients; temperatures at various heights; inversions; stable and unstable conditions in relation to flying.

Pressure: Importance; comparison with water; decrease with altitude; physiological effects of diminished pressure; measurement; mercurial and aneroid barometers and barographs: use, errors, corrections; determination of altitudes by means of barometers; isobars; pressure gradients.

The Wind in Relation to Pressure at Earth's Surface: Wind direction; deflection of winds from gradient: earth's rotation and friction; cyclonic and anticyclonic wind systems; "gradient wind;" Buys Ballot's Law; isobaric types. Wind velocity; general relation to gradient; Beaufort Scale and its equivalents in force and in velocity in miles an hour; anemometers; Robinson and Dines; gustiness of wind.

Conditions of the Atmosphere Affecting Aviation: General and Local: (*a*) general air movements, essentially horizontal; atmospheric

[1] Syllabus of ten lectures on Meteorology given in the course in aeronautical engineering at the Massachusetts Institute of Technology in cooperation with Harvard University, by Robert De C. Ward, professor of climatology, Harvard University.

layers and waves; (*b*) local convectional currents, essentially vertical, due to thermal controls: causes and conditions; (*c*) effects of topography upon air movements, combining both horizontal and vertical elements, due to mechanical controls: effects of friction, topography, and character of surface; vertical and horizontal movements in general in relation to flight.

Weather Forecasting: Explanation of daily weather map; principles of forecasting explained by reference to type maps, for United States and for Europe; general characteristics of cyclones and anticyclones; tracks; velocities of progression.

Non-Instrumental Local Forecasts: Barometric tendency; veering and backing winds; changes in wind velocity; weather proverbs.

Clouds: Types; cloud classification; methods of determining cloud heights and velocities, and results; value as weather prognostics; fair and wet weather clouds; fog, special consideration of cumulus and cumulo-nimbus.

Forecasts of Wind Velocity and Direction Aloft: Direct observation by means of pilot balloons, kites and cloud movements; directions of cloud movements in cyclonic and anticyclonic systems in the United States and in Europe; estimates based on surface conditions and on general knowledge of upper air currents; "gradient wind;" diurnal variation in wind velocity and direction; changes due to progression of cyclones and anticyclones; wind and cloud directions and night flying.

Favorable and Unfavorable Weather for Flying: Wind; clouds; haze, etc.

Laboratory Work is given at Blue Hill Observatory (10 hours) by Alexander G. McAdie, Abbott Lawrence Rotch, professor of meteorology, Harvard University, and director of the Blue Hill Meteorological Observatory, Readville, Mass.

THE DANIEL GIRAUD ELLIOT MEDAL

AT a meeting of the council of the National Academy of Sciences, held June 19, 1916, the gift of Miss Margaret Henderson Elliot of $8,000 to establish a fund in memory of her father, Daniel Giraud Elliot, was accepted. This money was given to be held in trust and invested in order that there should be an income annually for a medal to be known as the Daniel Giraud Elliot Gold Medal, and an honorarium to be awarded by the National Academy of Sciences.

The conditions under which the gift is to be administered are contained in the following two paragraphs of the deed of gift:

> One such medal and diploma shall be given in each year and they, with any unexpended balance of income for the year, shall be awarded by the said National Academy of Sciences to the author of such paper, essay or other work upon some branch of zoology or paleontology published during the year as in the opinion of the persons, or a majority of the persons, hereinafter appointed to be the judges in that regard, shall be the most meritorious and worthy of honor. The medal and diploma and surplus income shall not, however, for more than two years successively, be awarded for treatises upon any one branch of either of the sciences above mentioned. Professor Henry Fairfield Osborn, of New York, the scientific director of the American Museum of Natural History in New York City and the secretary of the Smithsonian Institute at Washington for the time being, are appointed as such judges. Vacancies at any time occurring in the number of the judges shall be filled by the council of the said National Academy of Sciences, and in each case of a vacancy it is the wish of the said Margaret Henderson Elliot that the council will, if practicable, appoint to the position an American naturalist eminent in zoology or paleontology.
>
> As science is not national the medal and diploma and surplus income may be conferred upon naturalists of any country, and as men eminent in their respective lines of scientific research will act as judges, it is the wish of the said Margaret Henderson Elliot that no person acting as such judge shall be deemed on that account ineligible to receive this annual gift, and the medal, diploma and surplus income may in any year be awarded to any one of the judges, if, in the opinion of his associates, he shall, by reason of the excellence of any treatise published by him during the year, be entitled to receive them.

The council of the academy has accepted the gift and has appointed as the three judges for the bestowal of the medal and honorarium:

President Henry Fairfield Osborn, of The American Museum of Natural History.

Secretary Charles D. Walcott, of the Smithsonian