more copper than the white hair of the same animals. We have also found that among heavy metal ions, cupric ion has by far the strongest catalytic effect on the autooxidation of dopa. Expressed in molar concentration, cupric ion is 70 times more active than manganous and 100 times more active than ferrous ion.

The above observations suggest that within resting melanoblasts sulfhydryl compounds keep balance with a copper-containing enzyme, in analogy with *in vitro* experiments where epidermal extracts and cupric ions neutralize each other's effect on the substrate dopa. Under the action of pigment-producing stimuli, such as radiation, this equilibrium is disturbed by the oxidation of –SH groups, the enzyme thus being enabled to act freely on the substrate to form pigment.

Further evidence for a balance between enzyme and inhibitor is found in the more stable conditions of genetically induced pigmentation. In mottled rabbits white skin samples containing no enzyme, as shown by negative dopa reaction, yield from 25% to 44% lower –SH values than pigmented skin samples of the same animal.

Detailed experimental data will be presented elsewhere.

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Detection of Sulfur-containing Amino Acids on Paper Chromatograms[1]

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The recent description, in a paper of Chargaff, *et al.* (*1*), of a method for the detection of cystine, cysteine, and methionine on paper chromatograms has prompted us to present a method employing potassium iodoplatinate as the reagent which we have used for similar purposes. Cystathionine, lanthionine, djenkolic acid, methionine sulfone and sulfoxide, cystine disulfoxide, and cysteine sulfinic acid, in addition to the first-mentioned amino acids, react with this compound. While, to our knowledge, it has not been used for chromatographic purposes, Sease and co-workers (*4*) have recently given a partial review of the literature on the reaction between organic sulfides and iodoplatinate and have described a quantitative procedure for analyzing organic sulfides and disulfides with iodoplatinate. Bleaching of the reagent by urine, albumin, tannic acid, gallic acid, pyrogallic acid, KCN, KCNS, and saliva, but not by urea, uric acid, starch, dextrin, sucrose, glycerol, gelatin, oxalic acid, tartaric acid, citric acid, carbon disulfide, and alcohol, was apparently first described in 1881 (*3*).

The reagents used are 0.066 *M* KI and 0.0033 *M* H_2PtCl_6. Mixing of equal volumes of these solutions yields a deep red solution, the color of which may be attributed to the ion $(PtI_6)^=$ (*3*). This reagent has been found stable for at least two weeks at room temperature. For spraying purposes, a 1: 6 dilution has given the best compromise between contrast and sensitivity.

TABLE 1

Amino acid	R_F	Bleaching time	Amount detected (γ)
Cystathionine	0.30	Immediate	24
Cysteine	*	2 min	12
Cysteine sulfinic acid	0.21	Immediate	12
Cysteic acid	0.10	Does not bleach	..
Cystine	0.25	2 min	12
Cystine disulfoxide	0.21	Immediate	12
Djenkolic acid	0.30	"	12
Lanthionine	0.27	"	24
Methionine	0.76	"	12
Methionine sulfone	0.65	"	18
Methionine sulfoxide	0.81	"	18

* Cysteine could not be detected on the chromatogram when phenol was used as a solvent.

In practice, the completed chromatogram is dried as usual and then washed thoroughly in a 1: 1 acetone-ether solution to remove traces of the chromatographing solvent. The paper is dried at 90° and sprayed evenly and lightly with the diluted reagent. Although all of the amino acids mentioned can be detected by bleached areas against a pink background when tested on filter paper without chromatographing, on a finished chromatogram the reagent is usually bleached throughout the entire area. However, it has been found that suspending the sheet or strip, still damp from spraying, in a covered crock or cylinder containing a layer of concentrated hydrochloric acid on the bottom causes a redevelopment of the pink color by the HCl vapors, except in the areas occupied by the sulfur amino acids, which remain colorless. Air drying of the redeveloped sheet (heat will cause charring) yields a chromatogram on which the bleached areas are stable for many days. Eventually, bleaching of the entire sheet occurs. In the case of methionine sulfoxide and cystine disulfoxide, the bleached spots were faintly yellow, and the application of a starch solution revealed the presence of iodine. This was not

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the case with methionine sulfone or cysteine sulfinic acid or with the other amino acids tested. Bleached areas may be more readily observed by the transmitted light of an X-ray viewer.

R_F values (*2*) for the phenol-ammonia-gas system, together with a description of the rapidity and sensitivity of the test, are given in Table 1. The column describing the amounts detectable denotes quantities which we have readily discerned. Sensitivity thresholds are probably much lower. On a nonchromatographed sheet methionine could be detected at a 0.4-γ level. Because of spreading during chromatographing, sensitivity is decreased.

Of the other amino acids ordinarily encountered, only threonine and serine affect the reagent at all. After 3 min these give only faint tests—not strong enough to be confused with the sulfur-containing amino acids. Except for cysteic acid, the reagent seems to be specific for the sulfur amino acids and is sensitive to the quantities commonly encountered in paper chromatography. It is rapid and convenient to apply and may be considered a useful adjunct to the many other methods rapidly becoming available for the detection and estimation of chromatographed material.

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A Brain-Wave "Correlator"

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What is believed to be a new instrument for analyzing the electrical activity of the brain consists of two square-wave generators, actuated by the outputs of two channels of an electroencephalograph. Each square-wave crosses the axis at the same instant that its original EEG signal does, but is independent of the latter's wave-form and amplitude. Addition of these square-waves produces a voltage which is a three-valued function of time, being positive when both inputs are positive, zero when they are of unlike sign, and negative when both are negative.

The "voltage" of this composite square-wave, as read on a suitably lagged and calibrated a-c voltmeter, indicates the fraction of the total time during which the two inputs are of the same sign. If the inputs are alike, this fraction is unity and the meter reads +1. If one input is reversed, the fraction is zero and the meter reads −1. Unrelated inputs are of the same sign half of the time, and the reading is zero. Intermediate positions of the meter quantify the correlations reproducibly and more precisely than can be done by inspection.

Monopolar leads (the "indifferent" lead being placed on the ear lobe) have been used in observations on man. To date, only positive correlations have appeared between any two electrodes on the scalp; yet low values of correlation obtainable with certain locations of electrodes indicate that the common activity introduced by the ear is not of much consequence. High correlations sometimes occur when electrodes are symmetrically placed. Disturbing noises or hyperventilation reduce the correlation.

In cats and monkeys with exposed cortex, correlation increases with proximity of the electrodes, but it also depends on functional organization. With the two electrodes in one neuronographic area a high correlation is obtained, but this drops—sometimes abruptly—when one electrode crosses the border into another area.

In one cat Metrazol and one other convulsant each lowered the correlation, whereas CO_2 raised it.

These correlators are now in use in clinical electroencephalography and in experimental neurophysiology, but it is too soon to estimate their full utility.

Spontaneous Increase in Potency of Thromboplastin From Acetone-extracted Brain Tissue[1]

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In the course of studies in our laboratory on the one-stage prothrombin test (Quick), a spontaneous increase was observed in the potency of thromboplastin prepared from an acetone-extracted (*2*) human brain specimen. Our methods for the preparation of reagents and for performing the prothrombin test are given in detail elsewhere (*1*). One feature of this procedure of significance in the present observations is the storage of large quantities of acetone-extracted brain in an evacuated calcium chloride desiccator in a refrigerator. We have found no significant change in the potency of thromboplastin prepared from brain tissue stored in this manner for periods up to two years, *provided the material is gradually used up during the period of storage.* However, we have found that unused *remnants* of brain tissue, stored in this manner, may exhibit striking increases in potency and other unusual characteristics.

The thromboplastin reagents used in these experiments were prepared by incubating 0.3 gm of acetone-extracted brain tissue in 5 cc of 0.9% NaCl solution for 15 min at 48°–50° C. The milky supernatant fluid was used for testing. Solutions of either 0.0075M or 0.025M $CaCl_2$ were used for recalcification. All dilutions of plasma and thromboplastin reagent were made with 0.9% NaCl.

A specimen consisting of several hundred grams of acetone-extracted human brain (H 46) showed no change in thromboplastic potency during a storage period of 210 days. A remnant consisting of 2.5 gm of this material, which was stored in a 50-cc Pyrex beaker, was

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