overnight. The reaction product isolated by the usual procedure formed colorless plates, m. p. 172–173°, after recrystallization from ligroin, yield, 0.8 g. This did not show any depression in a mixed melting point with a known specimen of *p*-methoxypropiophenone semicarbazone.

Anal. Calcd. for $C_{11}H_{15}O_2N_3$: C, 59.71; H, 6.83. Found: C, 60.03; H, 7.23.

3-*p*-Anisyl-4-hexanone (III).—Ten grams of β-3-*p*-anisyl-3,4-hexanediol (II) was added in small portions to 200 g. of 35% sulfuric acid. The mixture was stirred for forty minutes at 95–98°. After cooling, the product was extracted with benzene and this benzene solution washed with water, dried over anhydrous sodium sulfate and evaporated. When the residue was distilled under reduced pressure, 7.5 g. of colorless oil came over at 117–125° and 6 mm. By treating 0.5 g. of this distillate with semicarbazide sulfate in dilute alcohol there was obtained 0.4 g. of the semicarbazone,[3] m. p. 130–131°, after recrystallizations from ligroin and then from benzene.

Anal. Calcd. for $C_{14}H_{21}O_2N_3$: C, 63.85; H, 8.04. Found: C, 63.76; H, 8.22.

The oxime[2] of the dehydration product formed colorless plates, m. p. 113°.

Anal. Calcd. for $C_{13}H_{19}O_2N$: C, 70.55; H, 8.66. Found: C, 70.09; H, 8.19.

The Reaction of β-3-*p*-Anisyl-3,4-hexanediol (II) with a Mixture of Acetic Anhydride and Acetyl Bromide.—To a suspension of 3 g. of the β-hexanediol (II) in 30 cc. of acetic anhydride was added under stirring 5 drops of acetyl bromide. The reaction temperature rose spontaneously from 10 to 18° after fifteen minutes and all of the diol crystals went into solution. When the solution was stirred at 15° during additional fifteen minutes, a good quantity of long needles separated again. A small portion of this solid substance was taken out, pressed on a porous tile and recrystallized from ligroin. The product melted at 120–121° and was identified by the mixed melting point with the monoacetate of β-3-*p*-anisyl-3,4-hexanediol. If the reaction mixture was allowed to react further at the same temperature, the solids dissolved for the second time and a clear solution was obtained after five hours of stirring. At this stage, the solution was poured into ice-water added with several drops of pyridine. The oily product was extracted with benzene and the benzene solution washed with dilute hydrochloric acid, water, dilute sodium carbonate solution and finally with water, dried over anhydrous sodium sulfate and evaporated. The residue formed yellowish liquid and did not solidify in spite of several attempts. When 0.5 g. of the product was treated with semicarbazide in dilute alcohol, 0.5 g. of colorless plates, m. p. 128–130°, were obtained and found to be identical with the semicarbazone of 3-*p*-anisyl-4-hexanone (III) by a mixed melting point.

Attempted acetylation of the monoacetate of 3-*p*-anisyl-3,4-hexanediol with a mixture of acetic anhydride and acetyl bromide leads also to the formation of 3-*p*-anisyl-4-hexanone (III) as a result of the elimination of acetic acid.

***trans*-3,4-Di-*p*-anisyl-3-hexene.**—Starting from 4 g. of 3-*p*-anisyl-4-hexanone (III) above obtained, we prepared through 3,4-di-*p*-anisyl-3-hexanol *trans*-3,4-di-*p*-anisyl-3-hexene, m. p. 123–124° (mixed melting point!), according to the synthetical method of Kuwada,[2] Wessely[3] or Fieser[4] and respective collaborators; yield, 2 g.

Anal. Calcd. for $C_{20}H_{24}O_2$: C, 81.08; H, 8.01. Found: C, 80.56; H, 8.38.

Summary

1. *p*-Anisylglyoxal was obtained in good yields by the oxidation of *p*-methoxyacetophenone with selenium dioxide.

2. A new diastereomeric isomer of 3-*p*-anisyl-3,4-hexanediol resulted in the Grignard reaction of *p*-anisylglyoxal and ethylmagnesium iodide or of *p*-anisoylethylcarbinol and ethylmagnesium bromide.

3. Diethylstilbestrol was prepared also from this new *p*-anisylhexanediol in good yields.

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[CONTRIBUTION FROM THE COBB CHEMICAL LABORATORY, UNIVERSITY OF VIRGINIA]

Antitubercular Compounds. bis-(Aminoaryl)-cyclopropane Derivatives. 1-(2-Amino-4-thiazolyl)-2-(4-aminophenyl)-cyclopropane

BY DIETER G. MARKEES[1] AND ALFRED BURGER

On the basis of the correlation of the activity of DDT and similar chlorinated insecticides with the distribution coefficient of their "inhalation anesthetic" group,[2] the tuberculostatic activity of several compounds containing *p*-aminophenyl in place of *p*-chlorophenyl groups has been studied.[3,4,5,6] In the table of Läuger, Martin and Müller,[2] bis-*p*-chlorophenyl derivatives of cyclopropane were given an equally high insecticidal rating as the corresponding trichloroethane derivatives. Although these chlorinated cyclopropane derivatives were purely speculative[7] we decided to synthesize analogous bis-*p*-aminoaryl compounds for comparison with various bis-*p*-aminoaryl sulfones of proved chemotherapeutic value. The excellent pharmacological properties of Promizole (I)[8] suggested that we begin with a study of one of its cyclopropane analogs (II). A synthesis of II is recorded in this paper. An investigation of the bis-1,1- and -1,2-(4-aminophenyl)-cyclopropane series will be reported soon.

The starting material for the preparation of the diamine II was 2-phenylcyclopropanecarboxylic acid (III)[9] of which two stereoisomeric forms had been obtained by Burger and Yost.[10] Nitration of the lower-melting more abundant isomer yielded two mononitro derivatives. The chief product

(1) Charles C. Haskell Post-Doctorate Fellow.

(2) Läuger, Martin and Müller, *Helv. Chim. Acta*, **27**, 892 (1944).

(3) Burger, Graef and Bailey, THIS JOURNAL, **68**, 1725 (1946).

(4) Graef and Burger, *ibid.*, **68**, 2400 (1946).

(5) Kirkwood and Phillips, *ibid.*, **69**, 934 (1947).

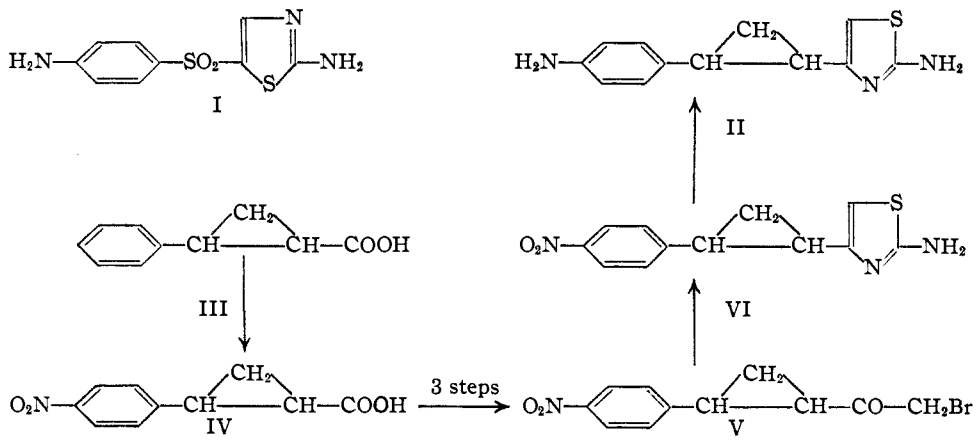
(6) Kirkwood, Phillips and McCoy, *ibid.*, **68**, 2405 (1946).

(7) Mylius and Koechlin, *Helv. Chim. Acta*, **29**, 405 (1946).

(8) Bambas, THIS JOURNAL, **67**, 671 (1945).

(9) Buchner and Geronimus, *Ber.*, **36**, 3782 (1903).

(10) Burger and Yost, THIS JOURNAL, **70**, 2198 (1948).



was 2-(*p*-nitrophenyl)-cyclopropane-1-carboxylic acid (IV). Its structure was confirmed by an independent synthesis from *p*-nitrostyrene and ethyl diazoacetate, and acid hydrolysis of the resulting ethyl ester.

The chloride of the nitro acid IV was treated with diazomethane, and the diazo ketone converted to the bromo ketone V. Condensation with thiourea yielded 1-(2-amino-4-thiazolyl)-2-(*p*-nitrophenyl)-cyclopropane (VI) which was reduced to the diamine II.

In an analogous manner, the chloride of the unnitrated acid III yielded 1-(2-amino-4-thiazolyl)-2-phenylcyclopropane. When thioformamide was used instead of thiourea in the thiazole ring closure, 1-(4-thiazolyl)-2-phenylcyclopropane was formed.

The configuration of the isomeric 2-phenylcyclopropanecarboxylic acids had previously not been determined with any certainty although Buchner and Geronimus[9] had oxidized the higher-melting isomer to *trans*-cyclopropane-1,2-dicarboxylic acid. On the basis of this degradation, they assigned the *trans*-configuration to the acid of m. p. 105–106°. However, as found by Burger and Yost,[10] this acid is easily inverted to the 2-phenylcyclopropanecarboxylic acid of m. p. 92°, and we are now presenting additional evidence that this lower-melting form is the *trans*-isomer. Reduction of the *p*-nitro acid (IV) and oxidation of the resulting 2-(*p*-aminophenyl)-cyclopropanecarboxylic acid with an alkaline solution of potassium permanganate, destroys the aromatic ring and furnishes *trans*-cyclopropane-1,2-dicarboxylic acid, identified by a mixture melting point with an authentic sample. While the configuration of neither of the two stereoisomeric 2-phenylcyclopropanecarboxylic acids can be deduced definitely from this degradation, the combination of the two factors, the instability of the higher-melting isomer, together with the degradation of the lower-melting isomer to *trans*-cyclopropanedicarboxylic acid, appears to support our configurational argument.

In order to confirm the identity of the *trans*-cyclopropane-1,2-dicarboxylic acids, their anilides were prepared by way of the dichlorides and found not to depress each others' melting point. *cis*-Cyclopropane dicarboxanilide, obtained in an analogous manner from authentic *cis*-cyclopropane-1,2-dicarboxylic acid, had different physical properties.

As communicated to us by Drs. Gregory and Solotorovsky of the Merck Institute of Therapeutic Research, the diamine II inhibits the growth of H37Rv strain *M. tuberculosis* in Dubos' medium at a concentration of 50 mg. per 100 cc.

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Experimental[11]

Diazoacetyl-2-phenylcyclopropane.—A solution of 10 g. of 2-phenylcyclopropanecarbonyl chloride in 10 cc. of dry ether was added slowly to a solution of *ca.* 10 g. of diazomethane in 450 cc. of ether and allowed to stand overnight. One-ninth of this ether solution was evaporated, and the residual diazo ketone was crystallized from petroleum ether. The pale yellow needles melted at 63–64°.

Anal. Calcd. for $C_{11}H_{10}N_2O$: C, 70.95; H, 5.41. Found: C, 70.95; H, 5.25.

Into the main portion of the ethereal reaction mixture containing the diazo ketone was dropped 50 cc. of 42% hydrobromic acid with mechanical stirring until no more nitrogen was evolved. The ether solution was washed free from acid and dried over sodium sulfate. The **bromoacetyl-2-phenylcyclopropane** from this solution was oily, the yield was 10 g.

1-(2-Amino-4-thiazolyl)-2-phenylcyclopropane.—A solution of 10 g. of crude bromoacetyl-2-phenylcyclopropane in 25 cc. of absolute ethanol was mixed with a suspension of 3.5 g. of thiourea in 40 cc. of ethanol at 30°. The exothermic reaction was completed by refluxing for thirty minutes, the cooled mixture was filtered, and the aminothiazole derivative was precipitated from the filtrate by addition of 250 cc. of 0.4% ammonium hydroxide. The oily precipitate crystallized soon and was recrystallized from dilute ethanol. The yield was 8.5 g. (94%). Final purification was performed by sublimation at 100° (2 mm.). The colorless prisms melted at 126–126.5°.

Anal. Calcd. for $C_{12}H_{12}N_2S$: N, 12.95. Found: N, 12.80.

(11) All melting points are corrected. The microanalyses were carried out by Clark Microanalytical Laboratory, Urbana, Ill., and by Mrs. Joyce B. Caliga of this Laboratory.

The **acetyl derivative** was prepared by heating the amine with an excess of acetic anhydride and a drop of concentrated sulfuric acid for a few minutes, and decomposing the reaction mixture with water. It was sublimed at 125° (2 mm.) and recrystallized from 50% ethanol. The shining leaflets melted at 155.5–156.5°.

Anal. Calcd. for $C_{14}H_{14}N_2OS$: N, 10.44. Found: N, 10.68.

1-(4-Thiazolyl)-2-phenylcyclopropane.—A solution of 2 g. of thioformamide in 5 cc. of ethanol was added to a solution of 6.5 g. of bromoacetyl-2-phenylcyclopropane in 20 cc. of the same solvent. The slightly exothermic condensation was held at 20° by immersion in cold water for four hours, the mixture was diluted with 50 cc. of water and made ammoniacal. The reaction product was isolated by extraction into ether and fractionation. The pale yellow oil boiled at 143–145° (2 mm.) and weighed 2 g. (36%).

Anal. Calcd. for $C_{12}H_{11}NS$: N, 6.96. Found: N, 6.76.

The **hydrochloride**, prepared in ether solution, crystallized from ethyl acetate as colorless prisms, m. p. 127–132° (dec.).

Anal. Calcd. for $C_{12}H_{11}NS \cdot HCl$: N, 5.89. Found: N, 6.17.

The **picrate** crystallized from ethanol as yellow prisms, m. p. 146–147°.

Anal. Calcd. for $C_{18}H_{14}N_4O_7S$: N, 13.02. Found: N, 13.09.

2-(*p*-Nitrophenyl)-cyclopropane Carboxylic Acid.—(a) The crude mixture of stereoisomeric 2-phenylcyclopropane carboxylic acids obtained by the method of Burger and Yost[10] was converted to the acid chloride, and this was hydrolyzed to the lower-melting 2-phenylcyclopropane carboxylic acid.[10] Thirty grams of this material was added in several portions to 195 cc. of nitric acid (d. 1.40) at 25° over a period of twenty minutes until all of the organic material had gone into solution. 2-(*p*-Nitrophenyl)-cyclopropanecarboxylic acid crystallized on cooling after some time. It was filtered through a sintered glass funnel, washed with 10 to 20 cc. of cold nitric acid (d. 1.39), and then with water. The crude pale yellow reaction product weighed 12.0 g. (31%) and attained its final melting point of 197–199° by one recrystallization from boiling xylene. If the nitration mixture is poured into water, a less pure product is obtained.

Anal. Calcd. for $C_{10}H_9NO_4$: N, 6.76. Found: N, 6.98.

The **methyl ester**, prepared with diazomethane in ether solution, appeared as almost colorless needles, which were recrystallized from petroleum ether and melted at 76–76.5°.

Anal. Calcd. for $C_{11}H_{11}NO_4$: N, 6.33. Found: N, 6.49.

Dilution of the nitric acid mother liquors of the crude 2-(*p*-nitrophenyl)-cyclopropanecarboxylic acid with water produced a crystalline precipitate which, after repeated recrystallization from benzene, appeared as pale yellow crystals, m. p. 143–145° after some sintering at 137°. It probably represents 2-(*o*- or *m*-nitrophenyl)-cyclopropanecarboxylic acid.

Anal. Calcd. for $C_{10}H_9NO_4$: C, 57.97; H, 4.38; N, 6.76. Found: C, 58.10; H, 4.53; N, 6.83.

(b) To a solution of 65 g. of *p*-nitrostyrene[12] in 120 cc. of xylene was added gradually 62.5 g. of ethyl diazoacetate in 30 cc. of xylene at 110–120° over a ninety minutes period. The temperature of the mixture rose to 140°, and refluxing was continued for one and one-half hours. The xylene was stripped under reduced pressure, and the residual oil was fractionated. Most of the ester boiled at 176–185° (3 mm.) and weighed 75.5 g. (83.5%). A small sample of the ethyl 2-*p*-nitrophenylcyclopropane carboxylate was purified further for analysis and boiled at 170° (3 mm.).

Anal. Calcd. for $C_{12}H_{13}NO_4$: N, 5.95. Found: N, 5.84.

Since ethyl *p*-nitrocinnamate is hydrolyzed best in acid solutions,[13] 70.5 g. of ethyl 2-(*p*-nitrophenyl)-cyclopropanecarboxylate was refluxed with a mixture of 80 cc. of water, 80 cc. of glacial acetic acid and 80 cc. of concentrated sulfuric acid for thirty minutes, the cooled mixture was treated with 700 cc. of ice water, and the precipitated nitro-acid was filtered, washed and dried. It weighed 55.5 g. (89.5%). Homogeneity of the nitro-acid was further assured by purification through the acid chloride. The crude nitro-acid was boiled with a solution of 50 cc. of thionyl chloride in 100 cc. of benzene for two hours, the solvents were stripped under reduced pressure, and the dark residue was fractionated. The yellow distillate boiled at 188–190° (3 mm.) and crystallized in the receiver. It melted at 50–65° and was used for further reactions.

In the distillation of a larger batch of this acid chloride, violent decomposition occurred, and therefore we preferred subsequently purification by crystallization from about 20 to 25 parts of boiling ligroin. The acid chloride consisted of colorless prisms, m. p. 66–68°.

Anal. Calcd. for $C_{10}H_{10}ClNO_3$: N, 6.21. Found: N, 6.36.

Treatment with hot water led to 2-(*p*-nitrophenylcyclopropane)-carboxylic acid, m. p. 197–199° after recrystallization from xylene.

Anal. Calcd. for $C_{10}H_9NO_4$: C, 57.97; H, 4.38. Found: C, 58.27; H, 4.38.

This material showed no mixture melting point depression with a sample of 2-(*p*-nitrophenylcyclopropane)-carboxylic acid obtained by method (a).

Esterification with diazomethane yielded methyl 2-(*p*-nitrophenylcyclopropane)-carboxylate, m. p. 75–77°.

Anal. Calcd. for $C_{11}H_{11}NO_4$: N, 6.33. Found: N, 6.43.

A sample of this ester did not depress the melting point of the ester prepared by method (a).

2-(*p*-Nitrophenyl)-cyclopropane Carboxamide.—A solution of 0.3 g. of 2-(*p*-nitrophenyl)-cyclopropanecarbonyl chloride in 3 cc. of benzene was shaken briefly with 1 cc. of 20% ammonium hydroxide, the precipitated amide was filtered and purified by sublimation at 170° (2 mm.) and recrystallized from ethanol. The colorless cubic crystals melted at 225–227°.

Anal. Calcd. for $C_{10}H_{10}N_2O_3$: N, 13.59. Found: N, 13.49.

2-(*p*-Nitrophenyl)-cyclopropane Carboxanilide.—This derivative was prepared in a manner analogous to that employed for the amide, using aniline. Recrystallization from 50% ethanol rendered colorless needles, m. p. 171.5–172.5°.

Anal. Calcd. for $C_{16}H_{14}N_2O_3$: N, 9.92. Found: N, 9.83.

2-(*p*-Acetamidophenyl)-cyclopropanecarboxylic Acid.—A suspension of 3.9 g. of 2-(*p*-nitrophenyl)-cyclopropanecarboxylic acid in 90 cc. of acetone absorbed a slight excess of hydrogen in the presence of 5 g. of Raney nickel catalyst at 40° and atmospheric pressure within ten hours. The catalyst was filtered with the aid of charcoal, and the filtrate was evaporated. No suitable solvent could be found to purify the crude crystalline amino acid, and the product was therefore acetylated with acetic anhydride at 80–90° until all the material had gone into solution. The reaction mixture was decomposed with water; the acetyl product crystallized on cooling. It was recrystallized from a 1:9 mixture of glacial acetic acid and butyl ether, and finally from hot water, m. p. 205–208°, after some sintering at 200°.

Anal. Calcd. for $C_{12}H_{13}NO_3$: N, 6.39. Found: N, 6.50.

(12) Strassburg, Gregg and Walling, THIS JOURNAL, **69**, 2141 (1947).

(13) Drewsen, *Ann.*, **212**, 150 (1882).

trans-**Cyclopropane-1,2-dicarboxylic Acid.**—A hot solution of 3 g. of crude 2-(*p*-aminophenyl)-cyclopropanecarboxylic acid in 200 cc. of a 1.5% sodium carbonate solution was treated with 25 g. of potassium permanganate, the mixture was boiled for one-half hour, and allowed to cool. A small excess of permanganate was reduced with sodium bisulfite, the manganese dioxide was filtered, the filtrate was acidified and extracted exhaustively with ether. The ether extract was evaporated, and the solid residue recrystallized from ether–petroleum ether with the aid of charcoal. Two sublimations at 150° (2 mm.) furnished colorless crystals, m. p. 175.5–178°.

A mixture melting point with *trans*-cyclopropane-1,2-dicarboxylic acid prepared by the method of Buchner and Papendieck[14] showed no depression.

The dicarboxylic acid was treated with a benzene solution of excess thionyl chloride at 95°, the solvents were removed, and the dichloride was distilled at 80° (6 mm.). The oily distillate (1.5 g.) was mixed with a solution of 1.2 g. of aniline in 3 cc. of benzene, and the resulting colorless precipitate was filtered, washed with benzene and recrystallized from ethanol; the **dianilide** appeared as prisms melting at 299–301°.

Anal. Calcd. for $C_{17}H_{16}N_2O_2$: N, 9.99. Found: N, 9.88.

A sample of *trans*-cyclopropane-1,2-dicarboxanilide prepared in the same manner from an authentic sample of the *trans*-dicarboxylic acid melted at 300–301°.

Anal. Calcd. for $C_{17}H_{16}N_2O_2$: N, 9.99. Found: N, 10.17.

A mixture melting point of this anilide with the one obtained from 2-(*p*-aminophenyl)-cyclopropanecarboxylic acid showed no depression.

cis-**Cyclopropane-1,2-dicarboxanilide.**—This isomer was prepared from *cis*-cyclopropane-1,2-dicarbonyl chloride[15] in a manner analogous to that described for the *trans*-isomer. Recrystallization from 50% ethanol led to colorless prisms, m. p. 192–193°.

Anal. Calcd. for $C_{17}H_{16}N_2O_2$: N, 9.99. Found: N, 9.99.

Diazoacetyl-2-(*p*-nitrophenyl)-cyclopropane.—A solution of 29 g. of 2-(*p*-nitrophenyl)-cyclopropane carbonyl chloride in 50 cc. of dry benzene was added to a solution of *ca.* 14.5 g. of diazomethane in 650 cc. of ether. After standing for forty-five minutes with occasional shaking a batch of diazo ketone which had crystallized out was filtered, and another batch was recovered by concentrating the mother liquors. The total yield of yellow prisms was 26 g. (87%). A sample was recrystallized from benzene–ligroin, m. p. 127–128°.

Anal. Calcd. for $C_{11}H_9N_3O_3$: C, 57.14; H, 3.92. Found: C, 56.95; H, 4.11.

Bromoacetyl-2-(*p*-nitrophenyl)-cyclopropane.—A suspension of 25.5 g. of the diazo ketone in 150 cc. of dioxane was treated with 25 cc. of 42% hydrobromic acid. After cessation of the initial gas evolution the mixture was warmed for ten minutes and then poured into 2 liters of ice-water. The bromo ketone crystallized readily and was washed with dilute cold sodium carbonate solution and water and weighed 30 g. (96%). A sample was recrystallized from methanol. The tan needles melted at 117.5–119°.

Anal. Calcd. for $C_{11}H_{10}BrNO_3$: N, 4.93. Found: N, 4.96.

(2-Amino-4-thiazolyl)-2-(*p*-nitrophenyl)-cyclopropane.—A suspension of 29 g. of the crude bromo ketone in 250 cc. of boiling ethanol was added to a cold suspension of 10 g. of thiourea in 100 cc. of ethanol. The mixture boiled spontaneously and the solids went into solution. After refluxing for one hour, and standing for one day, the mixture was poured into 2 l. of cold 0.1% ammonium hydroxide. The thiazole derivative precipitated as yellow needles which were filtered, washed and dried. The yield was 26.5 g. (99.5%). It was recrystallized from 50% pyridine and melted at 196.5–197.5°.

Anal. Calcd. for $C_{12}H_{11}N_3O_2S$: C, 55.16; H, 4.24; N, 16.08. Found: C, 55.43; H, 4.14; N, 16.04.

The **acetyl derivative** crystallized from 50% pyridine and could be sublimed at 200° (2 mm.). It melted at 221–222.5°.

Anal. Calcd. for $C_{14}H_{13}N_3O_3S$: N, 13.86. Found: N, 14.04.

(2-Amino-4-thiazolyl)-2-(*p*-aminophenyl)-cyclopropane.—A suspension of 10 g. of (2-amino-4-thiazolyl)-2-(*p*-nitrophenyl)-cyclopropane in 230 cc. of acetone was hydrogenated at 40° under the influence of 9 g. of Raney nickel catalyst. Absorption was completed in sixteen hours, the catalyst was filtered, and the pale yellow solution was evaporated. The oily diamine crystallized soon and was recrystallized from benzene. The yellowish crystals melted at 139–141.5°.

Anal. Calcd. for $C_{12}H_{13}N_3S$: C, 62.31; H, 5.66; N, 18.17. Found: C, 62.59; H, 5.37; N, 17.98.

Summary

2-*p*-Nitrophenylcyclopropanecarboxylic acid was obtained either by condensation of *p*-nitrostyrene with ethyl diazoacetate, or by nitration of 2-phenylcyclopropanecarboxylic acid A.[10] The chloride of the nitro-acid was converted to 1-bromoacetyl-2-(*p*-nitrophenyl)-cyclopropane by way of the diazo ketone, and the bromo ketone was condensed with thiourea. Reduction of the resulting nitro derivative furnished 1-(2-amino-4-thiazolyl)-2-(4-aminophenyl)-cyclopropane.

The synthesis of 1-(2-amino-4-thiazolyl)-2-phenylcyclopropane and of 1-(4-thiazolyl)-2-phenylcyclopropane was carried out in an analogous manner.

2-*p*-Nitrophenylcyclopropanecarboxylic acid was reduced, and the corresponding amino acid degraded to *trans*-1,2-cyclopropanedicarboxylic acid.

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(14) Buchner and Papendieck, *Ann.*, **284**, 212 (1895).

(15) Fichter and Spiegelberg, *Helv. Chim. Acta*, **12**, 1152 (1929).